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ORIGINAL ARTICLES.

HOUSING THE TUBERCULOUS PATIENT.

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The object of this article is to describe as briefly as possible, and to illustrate, some of the principal methods of housing tuberculous patients now being employed in the United States and Canada. These may be classed under the following heads: (1) Housing in large wards which differ in no material way from wards in general hospitals. This method is used at some institutions for advanced necessitous cases. (2) Housing in open dormitories or sleeping porches (sometimes called "lean-to's"), where patients are compelled to remain in the open air practically for the twenty-four hours of each day. (3) Housing in small cottages having four or five bedrooms grouped around a central sitting-room, and each bedroom having direct access to a general veranda or separate verandas, allowing of the beds being wheeled through wide doors. (4) Housing in single rooms in larger buildings in such manner as to obtain the advantages of cottage housing, together with the ease of administration which comes from placing a large number of patients under one roof. (5) For well-to-do patients cottages designed for private housekeeping, and which have a special suite for the patient, consisting of bedroom, bathroom, and "sleeping porch," and also accommodation for one or more members of the patient's family, and the servants, etc. It will be well to consider each of these methods.

1. The first method has little to commend it beyond economy of administration for advanced and dying cases. It should be borne in

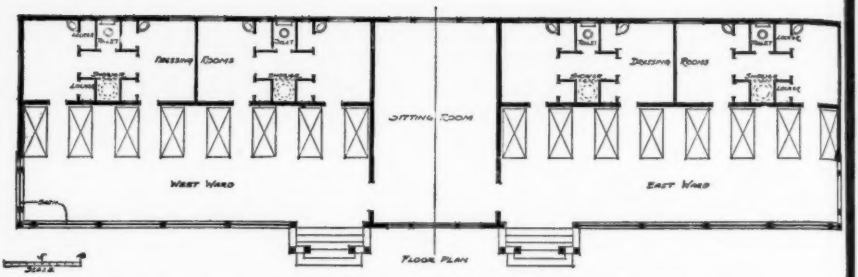


FIG. 1.—PLAN OF SHACK FOR THE MICHIGAN STATE SANATORIUM.

From the "Brickbuilder." *Scopes and Feustmann and Walter W. Judell, Associated Architects.*

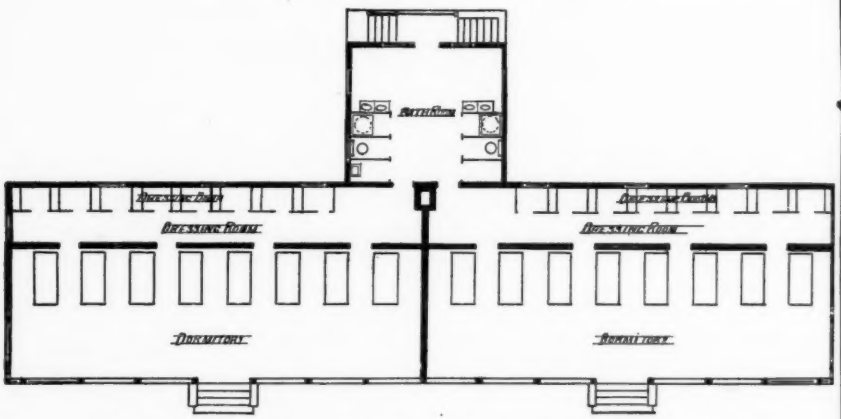


FIG 2.—PLAN OF DORMITORY OF THE GEORGIA STATE SANATORIUM.

From "Tuberculosis Hospital and Sanatorium Construction." *Scopes and Feustmann, Walter W. Judell } Associated Architects.*

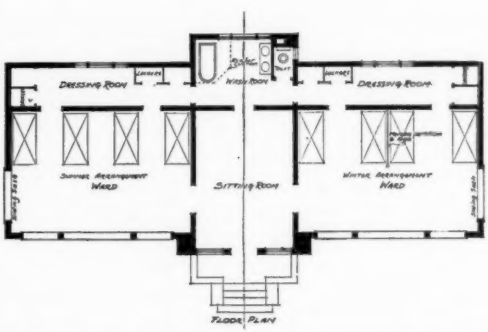


FIG. 3.—PLAN OF SHACK FOR THE VERMONT SANATORIUM.

From the "Brickbuilder." *Scopes and Feustmann and Walter W. Judell, Associated Architects.*

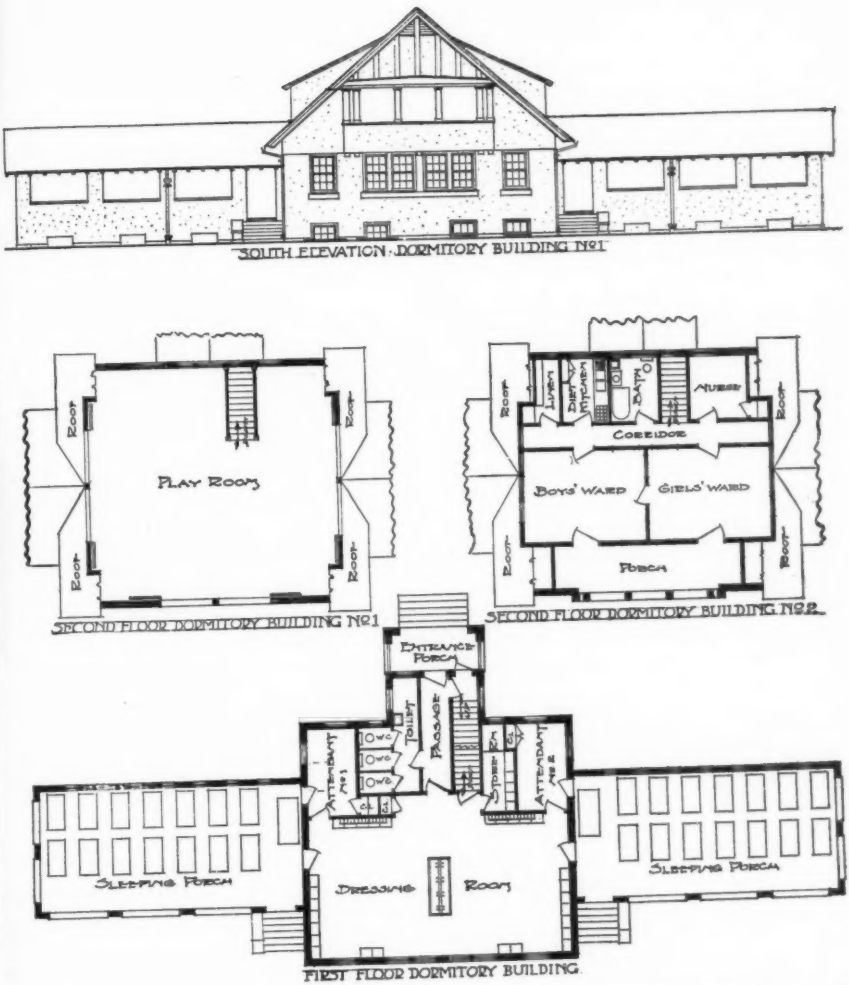


FIG. 4.—PLANS OF THE TUBERCULOSIS PREVENTORIUM FOR CHILDREN, FARMINGDALE, N.J.

From "Tuberculosis Hospital and Sanatorium Construction." *Scopes and Feustmann, Walter W. Judell } Associated Architects.*

mind that hospital treatment of tuberculous cases differs from that of most other diseases in that nothing could be more depressing for the individual, owing to certain peculiarities of the malady, than existence in a ward with eighteen or twenty other consumptives, many of whom are in the last stages of the disease. If *advanced* cases are to be treated, and wards seem necessary, the wards should contain no more than six patients, and sufficient open veranda space should be provided, so that all six patients can be wheeled outdoors when desirable. Proper roof protection should be provided for all verandas so that patients can be outdoors in any weather. Far advanced and dying tuberculous patients should have single rooms and small isolation verandas provided for their use, and allowing for the easy passage of patients' beds by wheeling.

If it seems necessary to treat *early* cases in large wards, such wards can very well be of the open dormitory type, as described later, and illustrated by Figs. 1, 2, 3, and 4.[1] This method of housing is often more economical in administration than the use of large, enclosed wards.

2. The history of the development of habitations of the second class has been well described by Dr. Carrington.[2] The idea of housing tuberculous patients in lean-to's was first suggested by Dr. Herbert M. King, of Loomis Sanatorium. He took as his model the old-time Adirondack lean-to camp, which is usually built of a framework of poles covered with bark, and describes his first building as a shed with an overhanging roof, open in front, with the ends constructed to be opened or closed as occasion demands. In the back wall were three openings, in which were placed stationary slat blinds, intended to increase the circulation of air, but which produced too direct a draught for use in winter. The building had a floor space 12 feet wide by 40 feet long, giving room for eight 30-inch beds, and was constructed of plain lumber neither painted nor stained on the interior, and covered externally with cedar shingles. In order to make it serviceable for the winter it was necessary to provide a heated dressing-room near at hand. This was obtained by an addition placed directly behind the lean-to and fitted with toilets and wash-basins, and heated by a stove surrounded by a water-coil which provided hot water for toilet purposes. "Later the design for this simple structure was modified, and a larger and more elaborate building constructed. This consists of two lean-to's placed end to end, somewhat wider than the original, and con-

[1] The English reader should note that in America it is customary to speak of the ground-floor as the first-floor; also that "porch" in America is synonymous with "veranda." In the text we have complied with British terminology, but it will be observed that in connection with some of the figures this course has not been possible.

[2] Carrington, Thomas Spees: "Tuberculosis Hospital and Sanatorium Construction." New York: National Association for the Study and Prevention of Tuberculosis, 105, East Twenty-second Street. 1911. Price 35 cents.

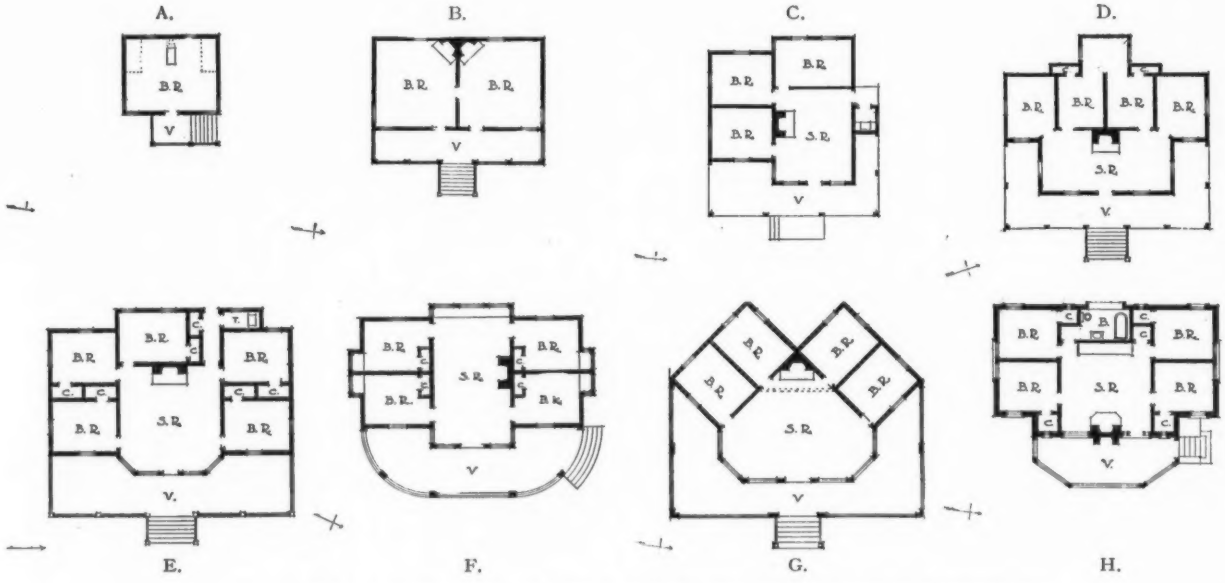


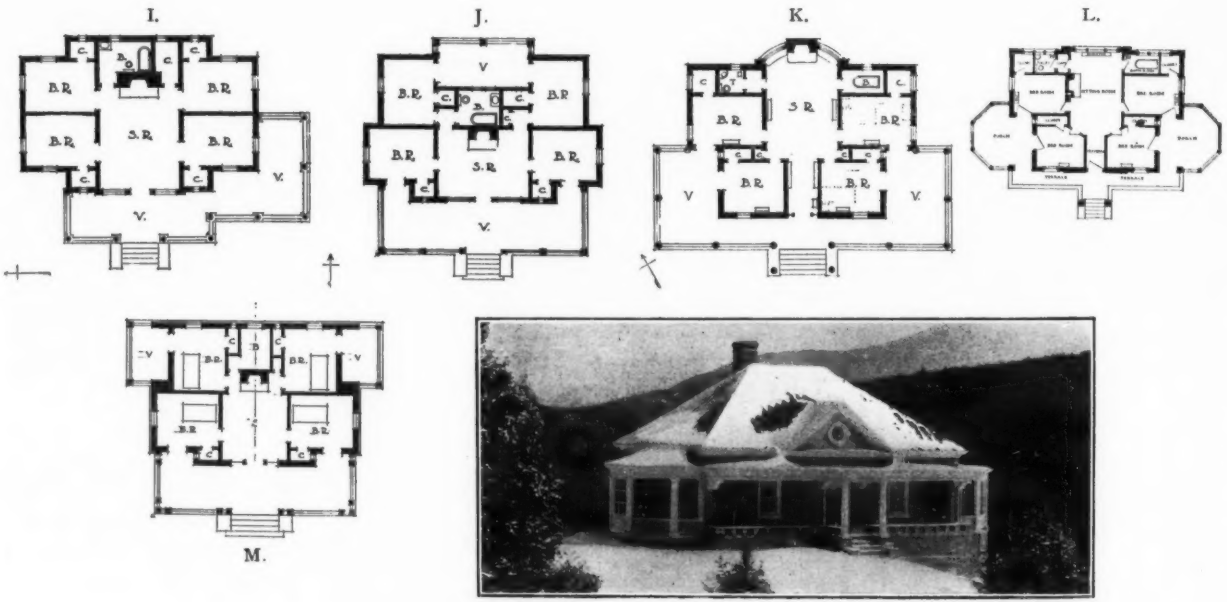
FIG. 5.—EVOLUTION OF THE COTTAGE, ADIRONDACK COTTAGE SANATORIUM.

From the "Brickbuilder." *Prepared by Scopes and Feustmann and Walter W. Judell from designs by various architects.*

nected by a sitting-room for use in bad weather, with a double locker and dressing-room directly back of it in an extension. The advantage obtained by this improvement over the first building was ample space for reclining chairs at the foot of the beds, protection from the weather, a warm sitting-room, and a larger dressing apartment."

Patients housed in lean-to's at the Loomis Sanatorium pay only a small sum for maintenance, and in many cases even this is remitted. This method of housing has been widely used throughout the United States. It is of great value when properly used, but the initial cost of such housing is so low that it has led to its adoption where a more permanent construction affording greater comfort to the patient should have been used. For instance, given a number of patients, say 100, among the necessitous class (and this method of housing need not be considered for any other class) who enter an institution as incipient cases, it is improbable that more than sixty should be housed in this manner. The balance should be housed partly in small wards, and some in single rooms, depending on the condition of the patient and the temperament of the individual. The reason for this is that at least 40 per cent. of incipient cases will develop acute and progressive phases of tuberculous disease requiring something more akin to a general hospital treatment, so that arrangements may be available whereby, when necessary, patients may be wheeled indoors as desired. However, every opportunity for being out of doors must of course be given in every case. Absolute rest out of doors in bed is insisted upon by many of our foremost authorities on the treatment of tuberculosis at certain critical stages of the disease. Of course, the open dormitory or lean-to type of housing can be more widely used in places having a warm climate. This type is difficult to use in Canada and most of the Northern States of the United States. It should not be forgotten, also, that lean-to's or open dormitory construction in its simplest form is only to be recommended where funds are limited. Indeed, this was the intention of its originators. Yet we know of instances where this method of housing has been adopted with heavy masonry construction and an elaboration of detail, the cost of which would have paid for much better accommodation and with more comfort for the patients. Of course, this was done in the belief that it was the best possible method of housing patients under all circumstances.

The open dormitory type of housing has been found to serve admirably for housing children at the Tuberculosis Preventorium for Children at Farmingdale, N.J. (see Fig. 4). This institution was founded for the purpose of caring for tuberculous and tuberculously disposed children of the crowded tenement districts of New York City, cases which have been exposed to tuberculous infection through contact with one or more members of a family ill with the disease, and



GENERAL VIEW OF COTTAGE "L."
Scopes and Feustmann and Walter W. Judell, Associated Architects.

FIG. 6.—EVOLUTION OF THE COTTAGE, ADIRONDACK COTTAGE SANATORIUM.
From the "Brickbuilder." *W. L. Coulter, Architect. Scopes and Feustmann and Walter W. Judell, Associated Architects.*

cases, moreover, whose physical condition would make them easy victims to the scourge.

3. The housing of patients in small cottages is generally conceded to be a method of housing for the tuberculous patient of much service,

FIG. 7.—PLANS OF THE RECEPTION HOSPITAL OF SARANAC LAKE, N.Y.

From the "Brickbuilder." *Scopes and Feustmann, Walter W. Judell } Associated Architects.*

and in institutions it has reached its highest form of development in Dr. E. L. Trudeau's Adirondack Cottage Sanatorium near Saranac Lake, situated in the northern part of the State of New York. It may prove of interest to follow the different stages of planning through which these cottages have passed by a careful study of Figs. 5 and 6.

The beginnings of Dr. Trudeau's famous establishment were modest indeed. Diagram A shows a one-room structure with a veranda barely large enough for two ordinary easy chairs; there were no toilet facilities. Gradually the comfort of the cottages was increased by the addition of a sitting-room, bathroom, and spacious verandas. The next step was the introduction of ventilated clothes closets, almost always forming part of the house construction in the United States and Canada (see Diagrams H and I).

A most important improvement in the cottage plan is shown in Diagram J. Here the verandas are so arranged that direct access

FIG. 8.—ADMINISTRATION BUILDING OF THE VERMONT SANATORIUM, PITTSFORD, VERMONT.

From the "Brickbuilder." *Scopes and Feustmann \ Associated Walter W. Judell / Architects.*

thereto is provided from each patient's room, and the beds may be wheeled through doorways 3 feet 8 inches wide. This cottage was designed in 1902 by the late W. L. Coulter, Esq. It was just about this time that the importance of outdoor sleeping was recognized by Dr. Trudeau, and the newer type of cottage was adopted to facilitate the application of this forward step in the treatment of tuberculosis. It may appear strange to the English reader, yet it is a fact that throughout the Adirondacks, the Catskills, and the Laurentians, many tuberculous patients spend all their nights out of doors, although the thermometer not infrequently registers 30° below zero, Fahrenheit.

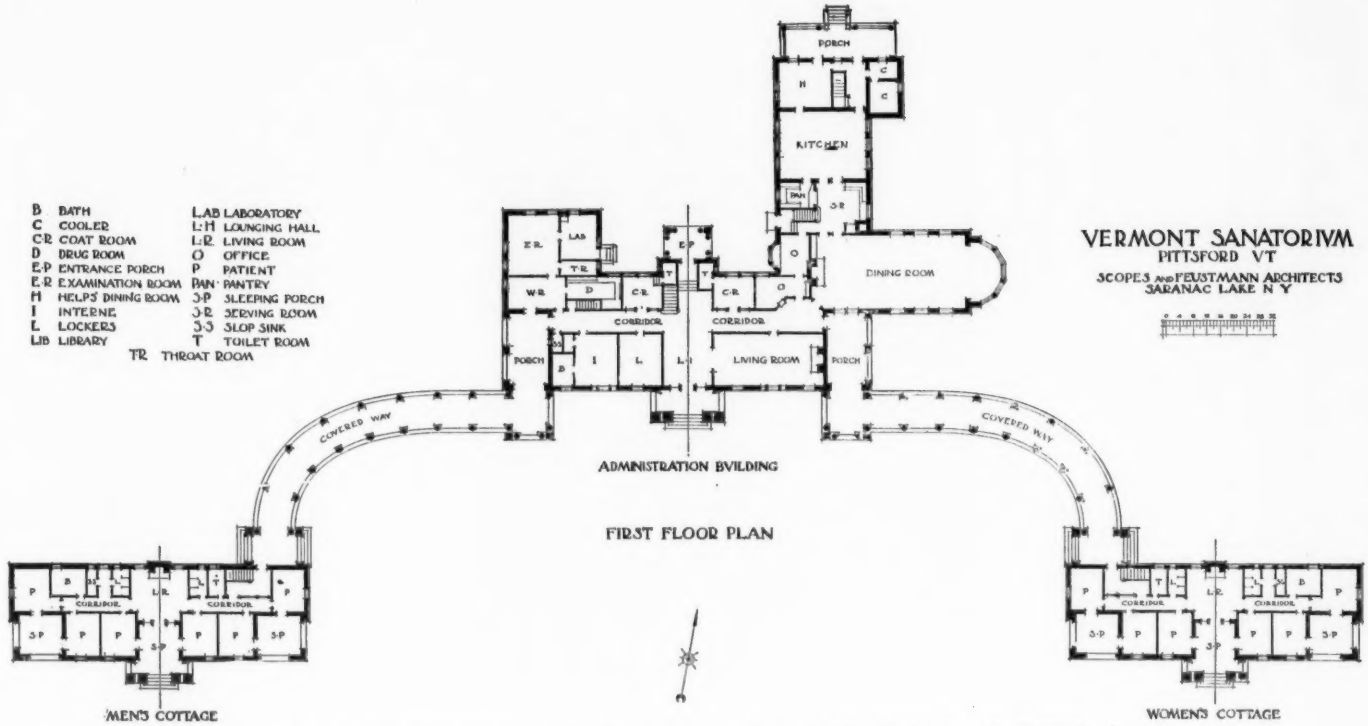


FIG. 9.—GROUND-FLOOR (FIRST-FLOOR IN U.S.A.) PLAN OF VERMONT SANATORIUM

From the "Brickbuilder."

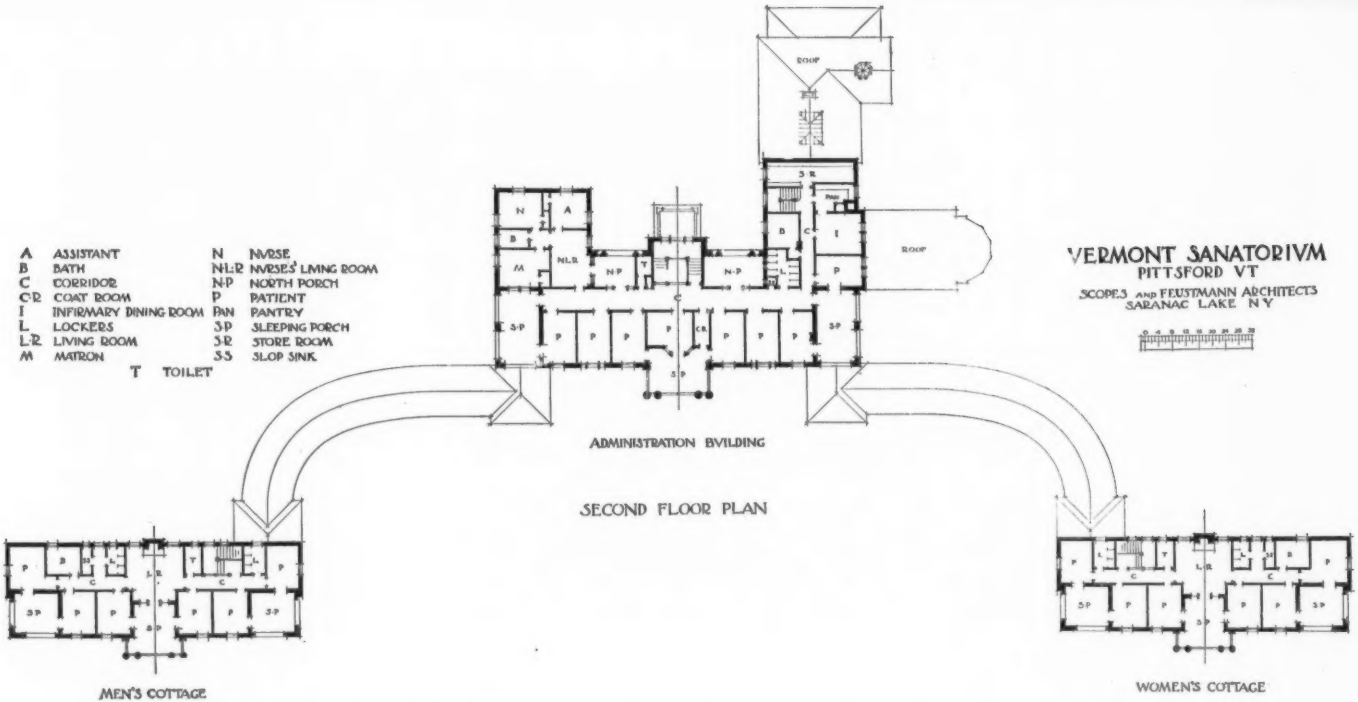


FIG. 10.—PLAN OF FIRST-FLOOR (SECOND-FLOOR IN U.S.A.) OF VERMONT SANATORIUM.

From the "Brickbuilder."

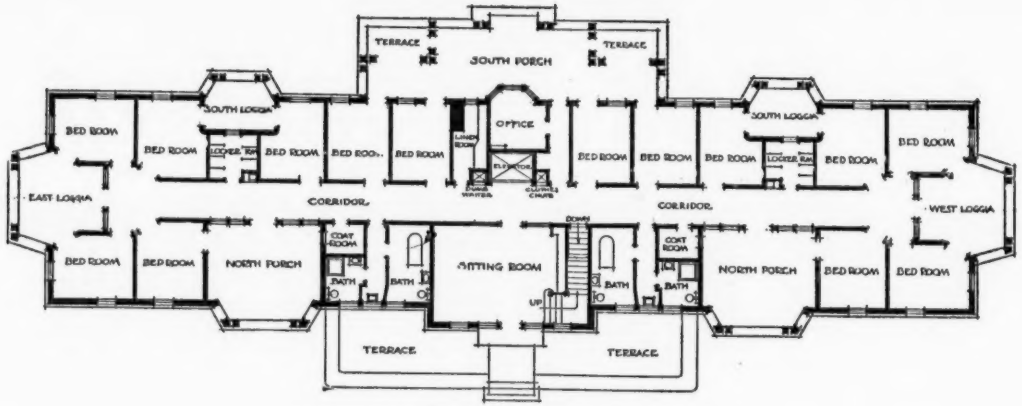
The most recent cottages at this sanatorium (Diagrams K, L, and M) were designed by Messrs. Scopes and Feustmann, all with improved sleeping verandas. In Plan M, all rooms, including the bathroom, receive some direct light through windows unshaded by verandas. Also, the latter are arranged to afford considerable privacy when used as sleeping quarters, while the large veranda extending across the front of the cottage makes a pleasant gathering-place for the patients and their friends during such time when the demands of the cure are somewhat relaxed. Only incipient cases, among patients who can afford but a nominal sum for treatment, are admitted to the Adirondack Cottage Sanatorium. Acute cases are cared for in the infirmary, which accommodates twelve patients in single rooms. A reception pavilion accommodating ten patients is provided, where patients are placed on arrival and carefully observed for about two weeks and given first instruction in the "cure." From this brief description, it may be seen that the method of housing patients at Dr. Trudeau's sanatorium—*i.e.*, four to a cottage amidst beautiful natural surroundings, comes as near the ideal as could be desired. But the cost, almost $1,250 per patient, for housing alone, is rather too high to admit of such a scheme being followed in all but a very few cases. Indeed, it might be said that this institution stands practically alone. There are, of course, many other excellent cottage sanatoria in Canada and the United States, notably the Loomis Sanatorium in the Catskills, but the unit of housing is larger, the average being about eight beds, thus materially decreasing both the initial outlay and the cost of administration.

4. The fourth scheme of housing was first adopted by the firm of the authors in 1904, for the designs of the Reception Hospital at Saranac Lake, New York. This is a purely local institution, and is intended for the care of such patients residing in Saranac Lake as may be suffering from an acute attack of tuberculous disease, or such complications as hæmorrhage or high fever, and who cannot afford the usual charges of a private nurse. Patients from out of town are not received directly into the institution. The charge is only $7 per week for board, nursing, and medical attendance. The Reception Hospital is chiefly intended for the reception of patients who come to Saranac Lake for admission to Dr. E. L. Trudeau's Adirondack Cottage Sanatorium, but who are unable to gain admission because of unfavourable symptoms, or because of the existence of a long waiting list; hence the name Reception Hospital. The value of a building of this description (which might be properly termed the Tuberculosis Infirmary of Saranac Lake) in any community where tuberculosis is treated, whether it be in a sanatorium, town or village, has been proven by nearly eight years of service. The objects aimed at in working out these plans were as follows: (1) To enable any patient, no matter how ill, to live out of

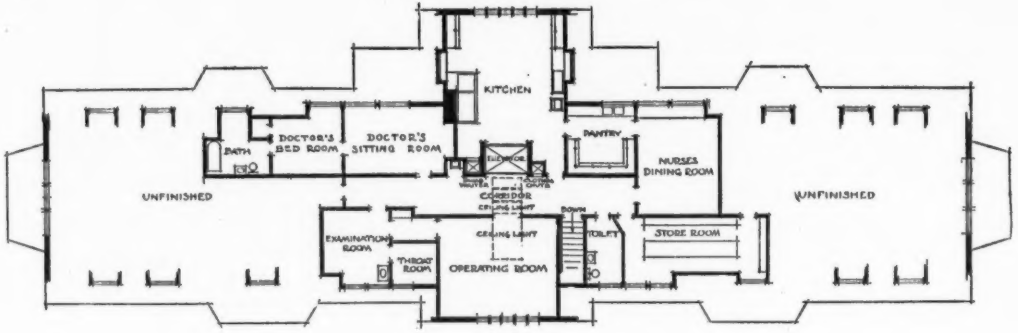
FIG. 11.—GENERAL VIEW OF THE VERMONT SANATORIUM, PITTSFORD, VERMONT.

Scopes and Feustmann } Associated
Walter W. Judell } Architects.

From the "Brickbuilder."



GROUND-FLOOR PLAN; FIRST-FLOOR SIMILAR.



ATTIC.

FIG. 12.—PLANS OF MARY LEWIS RECEPTION HOSPITAL, LOOMIS SANATORIUM, LOOMIS, N.Y.

From the "Brickbuilder." *Scopes and Feustmann and Walter W. Judell, Associated Architects.*

doors if desired. (2) To make buildings as attractive and homelike as possible, and to eliminate the usual institutional character. (3) To have all rooms and corridors well lighted, and all bedrooms unshaded

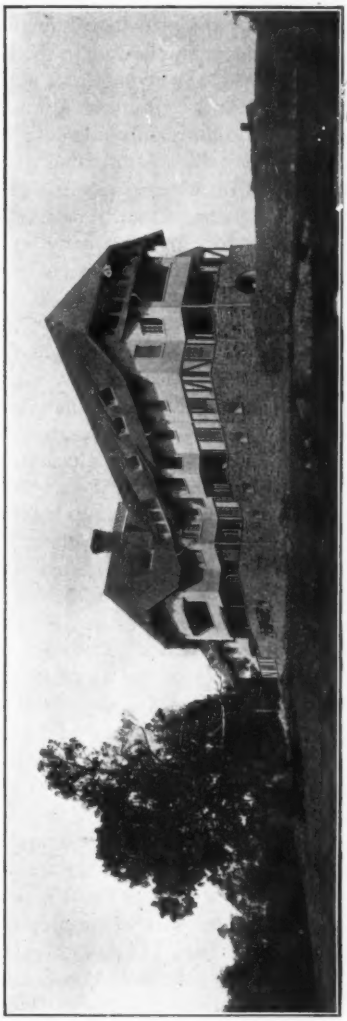


FIG. 13.—THE MARY LEWIS RECEPTION HOSPITAL, LOOMIS SANATORIUM, LOOMIS, N.Y.

From the "Brickbuilder." Scopes and Feustmann and Walter W. Judell, Associated Architects.

by the verandas. This is accomplished by the separation of the verandas, and by recessing in the body of the structure so as to introduce plenty of light into the centre of the building. It should

FIG. 12.—PLANS OF MARY LEWIS RECEPTION HOSPITAL, LOOMIS SANATORIUM, LOOMIS, N.Y.

From the "Brickbuilder." Scopes and Feustmann and Walter W. Judell, Associated Architects.

be noted in the general outline of the building that all cross dimensions are made small enough to insure good lighting of the interior. The separation of the porches has an added advantage in grouping together but a small number of patients. It also permits segregation when desired. In connection with this principle it might be well to add that the construction of a long row of rooms with verandas across the front, completely blanketing the rooms from sun and direct light, does not afford a solution of the problem, although it does make possible the wheeling of beds directly from indoor rooms to open-air verandas. (4) To make the natural ventilation such that a system of artificial ventilation would be unnecessary except in dining-rooms, where a number of patients congregate. This is accomplished by having the ends of all corridors open directly to the atmosphere, and by providing an abundance of lateral openings. (5) To make administration easy and economical as would be consistent with the arrangement for patients outlined above. These objects have been secured on a much larger scale in designing and constructing the Vermont Sanatorium, Pittsford, Vermont (Figs. 8, 9, 10, and 11); the Mary Lewis Reception Hospital, Loomis Sanatorium, Liberty, New York (Figs. 12 and 13); the Lake Edward Sanatorium, Lake Edward, Province of Quebec; the Laurentian Sanatorium, Ste. Agathe des Monts, Province of Quebec; County of St. Louis Sanatorium, Duluth, Minn.; the Tuberculosis Annex of the New Haven Hospital, New Haven, Conn.; and the Georgia State Sanatorium, Alto, Georgia.

Any institution having first made provision as outlined above for proper care of acute cases, can easily make additions to its plant by the erection of lean-to's and open dormitories in such proportion to total housing as experience shows is practicable. It is a mistake, however, to inaugurate a hospital or sanatorium for the treatment of tuberculosis merely by the erection of buildings of such a temporary character as lean-to's and shacks.

The planning of structures to house sanatorium patients has had its influence on the planning of private dwellings in suburbs and rural districts; this is particularly the case in regard to the sleeping veranda. A dozen years ago the usefulness of such a feature in house-planning would have been questioned. To-day possibly one out of every half-dozen American country houses is provided with a veranda or loggia on the sleeping-floor. And this in families where pulmonary affection has never been suspected, the pleasure and benefit of outdoor sleeping being recognized for the well person as for the invalid. The cottage of the late Dr. A. H. Allen, at Saranac Lake (Fig. 14), may serve as an example of housing for a private tuberculous patient. The house faces east, the main entrance being on the road, or west. On the ground-floor in a sheltered position free from draught in the

south-east angle of the building is the principal veranda, serving either as a general outdoor living-room or as breakfast-room in summer. Immediately above, but somewhat narrower, is the principal "sleeping-

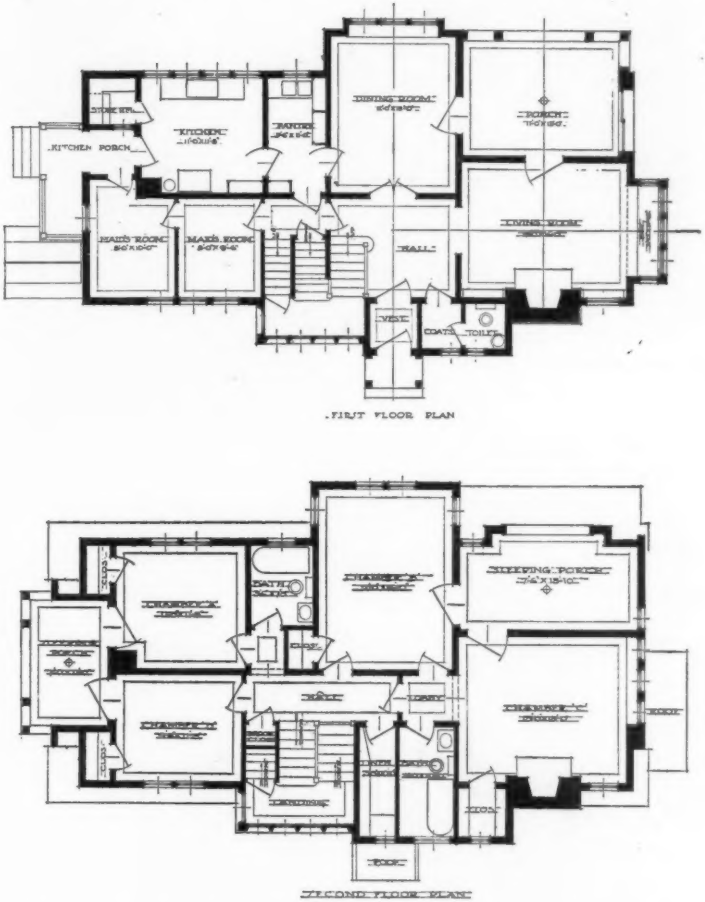


FIG. 14.—PLANS OF COTTAGE OF DR. A. H. ALLEN, SARANAC LAKE, N.Y.

From the "House Beautiful and American Suburbs."

Scopes and Feustmann } Associated
Walter W. Judell } Architects.

porch," accessible through wide doors from two bedrooms. Of these, Chamber C, having a fireplace and southern exposure, is the patient's room; Chamber B, separated from it by a small lobby, is the nurse's

FIG. 15.—DR. A. H. ALLEN'S HOUSE AT SARANAC LAKE, N.Y.

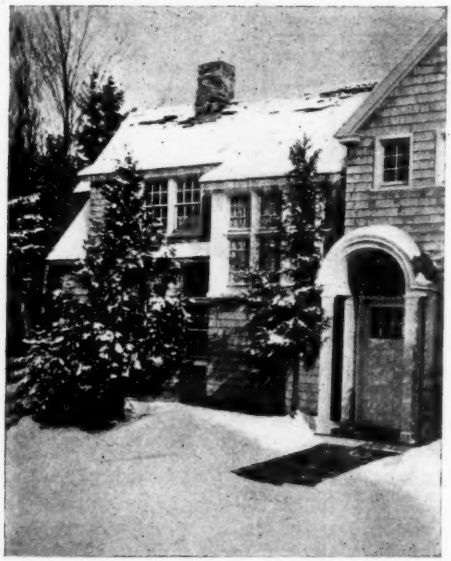


FIG. 16.—ANOTHER VIEW OF DR. ALLEN'S HOUSE.

From the "House Beautiful and American Suburbs." *Scopes and Feustmann* } *Associated*
Walter W. Judell } *Architects.*

or attendant's room. These two rooms and the near-by bath constitutes the patient's suite, and may be closed off from the rest of the house. At the other end of the corridor are two other (master's) rooms, having their own bath and sleeping-veranda. Thus all principal bedrooms have outdoor sleeping facilities. There is a servants' bathroom in the basement. The heating is by hot-water radiators in addition to the two fireplaces. While the Allen house was designed to meet the special requirements of a private patient visiting Saranac Lake for treatment, there seems to be no reason why similarly designed cottages would not answer for the housing of families where members desire to spend as much time out of doors as possible.

In the foregoing descriptions particular stress has been laid upon the planning of housing units for tuberculous patients. The subject of group planning has been scarcely touched upon, nor has it been possible in the space available to give any attention to the various problems of administration. Both of these subjects are of such vast importance that to attempt to do them justice would far exceed the length of such an article as the present.

CARL SPENGLER'S VIEWS AND METHODS REGARDING TUBERCULOSIS.

By WALTER H. FEARIS,

Author of "The Treatment of Tuberculosis by Means of the Immune Substances (I.K.) Therapy."

It is generally known that during the past twenty-two years Dr. Carl Spengler of Davos, one of the late Professor Koch's collaborators, has been carrying out researches on immunity and tuberculosis. These researches have proved to be of great importance and value to the medical practitioner engaged in the treatment of tuberculosis. In the limits of this article it is possible to give only a general idea of some of the most important points of Spengler's work; further details must be obtained from the literature on the subject.[1]

On the Etiology of Tuberculosis.

1. Primary Infection.—Spengler has shown that in most cases of tuberculosis in man two distinctly different and antagonistic types of

[1] In this connection the following may be mentioned: Spengler, Carl: "Tuberkulose- und Syphilis-Arbeiten." Davos: H. Erfurt. 1911. Fearis, W. H.: "The Treatment of Tuberculosis by Means of the Immune Substances (I.K.) Therapy: An Introduction to Carl Spengler's work on Immunity and Tuberculosis." With a Foreword by Dr. Carl Spengler. London: John Murray. 1912. The former work by Spengler contains all the articles contributed by him to various medical journals. The writer's work surveys all the literature on the subject contributed by Spengler and other authors up to the end of 1911.

tubercle bacilli are found—viz., (1) Koch's *brevis* and (2) Spengler's *humano-longus*. In cattle, only one type is found—the true bovine tubercle bacillus. His investigations show that although *humano-longus* and the true bovine tubercle bacillus are morphologically identical, yet they differ markedly in their pathogenicity to man. From the effects of inoculations of the living bacilli on himself, Spengler has shown that *humano-longus* is highly pathogenic, whereas the true bovine type is practically apathogenic to man. Klemperer and v. Baumgarten, by inoculating human beings with true bovine tubercle bacilli, have also obtained results similar to Spengler's. Hence, Spengler holds that the true bovine type is unable to cause progressive tuberculosis in man.[1] He regards the true bovine tubercle bacillus as a Jennerized *humano-longus*.

Spengler has devised special bacteriological methods for the examination of tubercle bacilli which are very useful in the treatment of tuberculosis. His picric acid method[2] is especially noteworthy. Spengler was the first to prove that tubercle bacilli formed sporoid bodies (Splitter).[3]

2. Secondary Infection in Pulmonary Tuberculosis.—Spengler carried out extensive investigations on the nature of the secondary infection and its influence on fever and the character of the disease.[4] He recognizes two main types of secondary infection:

(*a*) *Mixed Secondary Infection*, which is an infection of the tuberculous granulation tissue. In the sputum of cases thus infected it is impossible to separate the tubercle bacilli from the secondary bacteria by mechanical means.

(*b*) *Accompanying Secondary Infection*, in which the lung parenchyma is infected with tubercle bacilli alone, and the secondary bacteria are confined to the bronchial tract. In this case the tubercle bacilli can be separated from the secondary bacteria by Spengler's washing sedimentation method.[5]

His methods also enable us to distinguish between an active and a passive mixed infection.

Further, he has shown the frequent occurrence of pulmonary syphilo-tuberculosis, and has isolated a syphilis bacillus from such cases, whose subsequent development into *Spirochæta pallida* can be demonstrated.[6]

[1] Spengler, Carl: *Deutsche Med. Woch.*, No. 31, 1904; Nos. 31, 34, 1905. *Zeitschr. f. Experiment. Pathol. u. Therapie*, Bd. vi, 1909.
[2] Fearis, W. H.: "Treatment of Tuberculosis," etc., p. 10. London: John Murray. 1912.
[3] Spengler, Carl: *Wien. Med. Woch.*, 1902, No. 14. *Zeitschr. f. Hygiene und Infektionskrankheiten*, Bd. xlix. 1905.
[4] Spengler, Carl: "Tuberkulose- und Syphilis-Arbeiten," pp. 97 *et seq.*, 212 *et seq.*
[5] Spengler, Carl: *Zentralblatt f. Bacteriologie*, usw., Bd. xxx. 1901.
[6] Spengler, Carl: "Tuberkulose- und Syphilis-Arbeiten," pp. 370, 423.

On Tuberculin Treatment.

From the time of its introduction down to recent years Spengler has devoted especial attention to tuberculin. It is well known that these investigations, a number of which were carried out at Koch's suggestion, have contributed largely towards the removal of many of the causes of failure with tuberculin. His investigations on secondary infection and on fever, and his work on poison sensitiveness, enabled a scientific classification of cases to be made, in which the intensity, and not merely the extent of the disease, is taken into account.[1] He has shown that the curative action of tuberculin is proportional to the local reaction induced by it, and that the febrile reaction is of little therapeutic value.[2]

In 1904 Spengler introduced the first tuberculin—"P.T.O."—made from true bovine tubercle bacilli. He has found that with most tuberculous human beings "bovine" tuberculin has a better curative action, and produces less toxic effects than "human" tuberculin prepared from Koch's *Bacillus tuberculosis brevis*.[3]

He has shown that in administering tuberculin one should always commence with a course of that tuberculin—human or bovine—which causes the less toxic reaction in each particular case, and afterwards a course of the other kind of tuberculin should be given. This is Spengler's alternating-tuberculin therapy, which has been found to give better results than can be obtained with only one kind of tuberculin.[4] In passing it must be mentioned that Dr. Camac Wilkinson's excellent work with tuberculin is based on, and is an extension of, Spengler's tuberculin methods.[5]

The Immune Substances (I.K.) Treatment.

Although, when it is used correctly in suitable cases, tuberculin gives much better results than open-air treatment alone, yet Spengler realized its defects due to the toxic action of tuberculin, and to its uselessness in cases unable to respond adequately; hence he has elaborated a curative immunizing agent—"I.K."—which is free from these defects.

In 1907 Spengler discovered that the red blood-cells are the chief seats of generation and accumulation of the tuberculosis immune substances.[6] This has been confirmed by Fuchs-Wolfring's extensive

[1] Spengler, Carl: "Klassenstadieneinteilung der Lungentuberkulose und Phthise, und über Tuberkulinbehandlung." Aus der Koch's *Festschrift*, 1903.
[2] Spengler, Carl: *Berlin. Klinische Woch.*, No. 21, 1898.
[3] Spengler, Carl: *Deutsche Med. Woch.*, No. 31, 1904; No. 31, 34, 1905.
[4] Spengler, Carl: *Deutsche Med Woch.* See also *Wiener Klin. Rundschau*, 1906, No. 33.
[5] Wilkinson, Camac: "Tuberculin in the Diagnosis and Treatment of Tuberculosis." London: James Nisbet and Co. 1912.
[6] Spengler, Carl: *Deutsche Med. Woch.*, No. 38, 1908.

blood-investigations, and forms the chief foundation of I.K. therapy.[1] (I.K. is an abbreviation of *Immunkörper* = immune substances.)

In rabbits Spengler induces a high bacteriolytic antitoxic immunity against (1) tubercle bacilli—Koch's *brevis* and Spengler's *humano-longus;* (2) bacteria causing secondary infection. The immune blood is collected from the rabbits with aseptic precautions, diluted, acidified, and the bactericidal and antitoxic actions are adjusted.[2] The finished product is termed "I.K. Original." It contains immune substances against both tubercle bacilli and the bacteria causing secondary infection. The chief immune substances in it are (1) *lysins*, which destroy the bacteria causing tuberculosis; and (2) *antitoxins*, which neutralize the toxins originating from the bacteria. "I.K. Original" keeps perfectly for many months; it is advisable, however, to prepare freshly each month the dilutions used in the administration of the treatment.

The powerful bactericidal and antitoxic actions of I.K. have been established by experiments on animals.[3] I.K. produces no anaphylaxis.[4]

In open-air treatment and in tuberculin treatment, if the patient's cells are too enfeebled to generate the immune substances necessary to overcome the infecting bacteria, then these treatments fail. Hence the great advantage of I.K. over the open-air and tuberculin treatments, since it enables the practitioner to supply the patient with the necessary immune substances ready prepared, although the patient's cells may be too enfeebled to generate them in sufficient quantities. In short, the primary action of I.K. is the production of *passive immunity*.

After a time, through the bactericidal and antitoxic actions of I.K., the patient's cells become freed from toxic effects, and gradually regain their ability of generating the necessary immune substances in response to auto-inoculations of *neutralized* toxins. The latter are formed by the action of the antitoxins in I.K. upon the bacterial toxins in the patient. These neutralized toxins induce *active immunity* without causing toxic effects.[5]

The Advantages of I.K. over Tuberculin.

From the foregoing it will be seen that I.K. is fundamentally different from tuberculin.[6] The following advantages over tuberculin are noteworthy:

[1] Fuchs-Wolfring: *Beitr. z. Klinik der Tuberkulose*, Bd. xiv., H. 2. Investigations on which the writer is now engaged also show that the blood-cells contain far more tubercle bacilli precipitins than the corresponding serum.

[2] Spengler, Carl: "Tuberkulose- und Syphilis-Arbeiten," p. 459 *et seq.*

[3] Spengler, Carl: "Tuberkulose- und Syphilis-Arbeiten," p. 475 *et seq.*

[4] Spengler, Carl: "Tuberkulose- und Syphilis-Arbeiten," p. 494.

[5] Fearis, W. H.: "The Treatment of Tuberculosis by Means of the Immune Substances (I.K.) Treatment," pp. 69, 82. London: John Murray. 1912.

[6] Fearis, W. H.: "The Treatment of Tuberculosis," etc., p. 83. London: John Murray. 1912.

1. I.K. is not only atoxic and bactericidal, but it is also *powerfully antitoxic*, which makes its administration much easier and safer than tuberculin (a toxic substance).

2. I.K. produces passive as well as active immunity. It produces a rapid increase of immunity[1] even when the patient's cells are too enfeebled to generate the necessary immune substances.

3. There are *no contra-indications* to the use of I.K.[2]

4. In I.K. treatment active immunity is induced by neutralized toxins without the production of toxic symptoms.

Results with I.K.

Over fifty articles have been contributed to medical journals by physicians who have used the treatment.[3] The majority are decidedly favourable to it; the relatively few unfavourable reports have been shown to be due either to the very bad nature of the cases on which it was tested—in some cases even I.K. can do little—or to incorrect methods. Though much simpler to use than tuberculin, correct administration is essential.

The reports prove that I.K. has a marked bactericidal and antitoxic action. The latter is especially referred to by many authors who noted the rapid decrease of toxic symptoms caused by it.[4] Improvement of the general and local conditions occurred much more rapidly than without it. The absence of contra-indications to its use is noted. The value of I.K. in non-pulmonary tuberculous cases is also well established, especially in renal cases.[5]

Comparative statistics show that I.K. gives better results than tuberculin treatment, and very much better results than open-air treatment alone, even when the I.K. statistics are taken from reports of authors such as Simon and Kerlé, who used it in a sceptical spirit.[6]

[1] Fuchs-Wolfring: *Beitr. z. Klinik der Tuberkulose*, p. 178, Bd. xiv., H. 2.

[2] See, for example, articles by Awtokratoff, Benöhr and Hoffmann, Castaigne and Gourand, Hollós, Kirschenblatt, Lukin and Wallerstein, alluded to in the footnote below.

[3] For an admirable and critical review of these reports, see Fuchs-Wolfring: "Zur I.K.-Behandlung." Wiesbaden: J. F. Bergmann. 1911.

[4] For example, see Awtokratoff: *Wratschebnaja Gazeta*, Nos. 49, 50, 1909; and *Zeitschr. f. Tuberk.*, p. 474, November, 1910.
Benöhr and Hoffmann: *Beitr. z. Klin. der Tuberk.*, Bd. xvi., H. 4.
Castaigne and Gourand: *Jnl. Méd. Français*, No. 5, 1911.
Hollós: *Zeitschr. f. Experiment. Pathol.*, usw., Bd. xviii., 1911.
Kirschenblatt: *Zeits. f. Tuberk.*, Bd. xiv., H. 3.
Leigh: *The Therapist*, August 15, 1911.
Lukin: *Beitr. z. Klin. d. Tuberk.*, Bd. xviii., H. 3.
Wallerstein: *Berlin. Klin. Woch.*, No. 16, 1910.
Wein: *Wiener Klin. Woch.*, No. 3, 1912.

[5] See especially Castaigne and Gourand: *Jnl. Méd. Français*, No. 5, 1911; also articles by Awtokratoff, Hollós, and Benöhr, mentioned above.

[6] Fearis, W. H.: "Treatment of Tuberculosis," etc. London: John Murray. 1912.

Importance of I.K. in the "Dispensary" Service of "Sanatorium Benefit."

The excellent results published by many practitioners[1] who have used I.K. in the treatment of poor out-patients living under unfavourable conditions—many of these cases being treated whilst at work—point to the special value of the treatment for "dispensary" service. Its particular suitability for this purpose is shown by (1) the relative simplicity of its administration; (2) the absence of contra-indications; (3) the proved high efficiency of the treatment, even under adverse conditions; (4) the fact that many cases can be treated successfully whilst remaining at work; (5) the value of I.K. in the prevention of relapse without interference with the patient's employment; (6) the inexpensiveness of the treatment; (7) the excellent "keeping" properties of I.K.; (8) its freedom from harmful action when used according to Spengler's instructions.

In the administration of I.K. in dispensaries, early diagnosis and the control of arrested cases is especially important.[2] For these purposes Spengler's bacteriological methods, and particularly his rapid precipitation method of estimating immunity, are of great value. Occasional determination of the patient's immunity, in conjunction with other observations, gives important information as to the necessity of an immunizing course of I.K. treatment, which can be administered without interference with the patient's employment. In this way, by raising the patient's immunity, should this be needed, relapse can be prevented.

Sanatoria should be reserved for bad and difficult cases. I.K. can, of course, be combined with open-air treatment.

Use of I.K. in General Practice.

The successful results already obtained and published by many general practitioners show that, with improved facilities for early diagnosis, the general practitioner is destined to play an important rôle in the campaign against tuberculosis. Most early cases can be treated quite successfully with I.K. without removal of the patients from their homes.

[1] See articles by Awtokratoff, Benöhr and Hoffmann, Hollós, Kirschenblatt, Leigh, Lukin and Wallerstein, mentioned above. See also Mitulescu: *Zeitschr. f. Tuberk.*, Bd. xv., H. 5. Pumr: *Beitr. z. Klin. d. Tuberk.*, Bd. xvi., H. 4. Westphal: *Beitr. z. Klin. d. Tuberk.*, Bd. xvi., H. 4.

[2] Fearis, W. H.: "Treatment of Tuberculosis," etc., pp. 90, 177 *et seq.* London: John Murray. 1912.

THE FUTURE OF DISPENSARY AND DOMICILIARY MANAGEMENT OF TUBERCULOSIS.

By DAVID J. WILLIAMSON,
M.D.,
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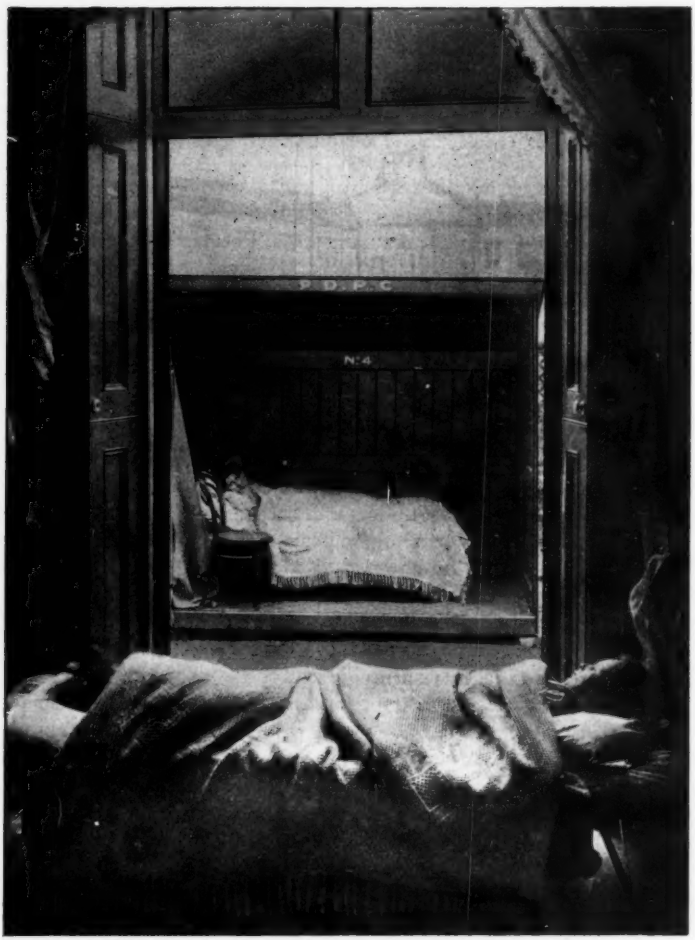
Although for the administration of the National Insurance Act the Local Government Board distinguishes between dispensary treatment and domiciliary treatment of tuberculosis, we may consider them for the moment as one and the same thing. The essential point in common is that the patient continues to live at home while being treated. Practically all the existing tuberculosis dispensaries have hitherto undertaken the treatment of advanced cases confined to bed in their own homes, provided the home conditions have been such that the risk of infection was not too great, in which case they have been isolated in Poor Law infirmaries and hospitals for advanced cases.

It is possible that, as far as *insured* consumptives are concerned, arrangements may be made for the treatment of those confined to bed, by a panel of general practitioners, under the supervision of the chief medical officer of the local tuberculosis dispensary, who, if the dispensary be approved by the Local Government Board, is to be recognized as the consulting tuberculosis officer for the district served by that dispensary. Strictly speaking, in urban districts the term "domiciliary treatment," as used by the Local Government Board, applies merely to the above arrangement.

In rural districts, where distances are great and the smaller villages very inaccessible, the general practitioners will probably play a far more important rôle in the scheme, and the term "domiciliary treatment" will cover the treatment by general practitioners, under the supervision of the tuberculosis officer, of cases in every stage of the disease. Here the importance of the treatment of patients with tuberculin being strictly supervised by the tuberculosis officer is very obvious. Otherwise we should speedily have a repetition of the fiasco of 1896.

The change in attitude of the medical profession with regard to the dispensary or domiciliary as opposed to the institutional treatment of tuberculosis which has come about within the last year or so is astonishing. We are warned in the Bible that many false prophets shall arise in latter days, and truly this country has suffered in the past—at least, as far as the eradication of tuberculosis is concerned—

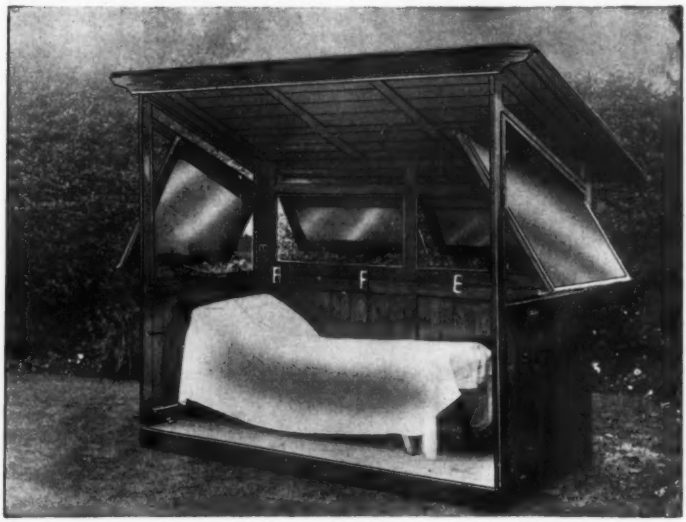
by listening to the conflicting advice of these over-enthusiastic gentlemen, whose chief fault lies, perhaps, in a lack of the proper sense of proportion, rather than in any wilful desire to mislead the country.



DOMICILIARY TREATMENT: OPEN-AIR METHODS EXEMPLIFIED.

Thus, we have had the segregation of all cases, the sanatorium treatment of all cases, and the tuberculin treatment of all cases, each advocated in turn as being the true means of stamping out the disease.

Certainly, judging from the unfortunate term "sanatorium benefits" which was applied to that part of the Insurance Act dealing with tuberculosis, and from some of the earlier political speeches, we were not led to expect much in the way of a well-conceived plan for fighting the disease. It must therefore have come as a surprise to many when the Departmental Committee published its Interim Report, setting forth a plan characterized by its broad outlook, clear insight, and definiteness of purpose. Proper provision was there made for the prevention, detection, and early diagnosis, of tuberculosis, as well as for the appropriate treatment of patients in every stage of the disease. But the most remarkable thing about the report was the important



THE DISPENSARY SHELTER ARRANGED FOR NIGHT USE.

place in the scheme which was given to the tuberculosis dispensary. Many of the local authorities, Borough and County Councils, had probably never heard of such an institution; certainly very few of them knew anything of its functions.

From 1887 to 1909, when the Paddington Dispensary was opened, the Victoria Dispensary, Edinburgh, was the only one in existence in the British Isles. During these last three years, however, an active educational campaign has been carried on, which has resulted in the establishment of ten other dispensaries in London, besides several in the provinces, and which has finally culminated in the official adoption by the Government of an organized scheme similar to that in existence

in Edinburgh, as the fundamental basis of a national campaign against tuberculosis.

The dispensary now takes its stand as the headquarters of the campaign in any given district. The importance of the other factors —the sanatorium, the open-air school, the hospital for advanced cases, and the hospital for surgical tuberculosis—is not thereby diminished. By having their proper functions prescribed and by being linked up to the dispensary, which will feed them with the appropriate class of patients, the work of these institutions will become more efficient, and each will bear its proper share of the fight. The brunt of the

THE DISPENSARY SHELTER PACKED FOR CONVENIENCE IN REMOVAL.

battle, which undoubtedly lies in the homes of the poor, must, however, be borne by the dispensary.

The final eradication of tuberculosis could never be accomplished by treating those already attacked, and allowing the spread of infection to go on unchecked. Nor is it practicable to prevent this spread by isolating every case, for the two simple reasons—(1) that there are too many patients, and (2) that the duration of the disease is too long. Therefore the dispensary, with its staff of doctors, nurses, and voluntary visitors, must endeavour to prevent such spread of infection occurring. In addition it must search out unsuspected cases, and supply them with appropriate treatment immediately. Herein lies the value of contact examination, as also of the open-air school and

the sanatorium. The bulk of the patients must, however, be treated by the dispensary itself, without being sent to a sanatorium. That such treatment may be successful when combined with improvement of the home conditions has hardly been sufficiently realized, though of late the renewed interest in tuberculin treatment has done much to bring home treatment back to favour. The dispensaries will probably make considerable use of open-air shelters in patients' backyards and gardens. The results obtained by these are sometimes astounding.

CRITICAL REVIEWS.

RECENT ADVANCES IN THE CULTIVATION OF THE TUBERCLE BACILLUS.

By JOHN CRUICKSHANK,
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Pathologist to the Crichton Royal Institution, Dumfries; late Assistant to the Professor of Pathology, Glasgow University.

Since the discovery of the tubercle bacillus by Koch in 1882, probably more attention has been paid to the problems associated with tuberculosis than to those of any other disease. In spite, however, of an enormous amount of research, many of the more difficult and important problems have remained unsolved or have been only partially elucidated. Much of our lack of knowledge can be explained by the difficulties which have been met with in obtaining cultures of the tubercle bacillus. Until comparatively recently the cultivation of *Bacillus tuberculosis* was a matter of great difficulty, and in consequence most of our knowledge has been obtained from the results of inoculation experiments in animals. Considerable advance has, however, been made within the last few years. In the first place, certain agents have been devised which are capable of isolating tubercle bacilli from other organisms with which they are usually mixed in tuberculous tissues and excretions; and, in the second place, new culture media capable of giving rapid and abundant growth of the bacillus have been introduced. By methods involving the combination of these two procedures it has been found possible to obtain direct cultures from such materials as sputum, urine, joint fluids, and caseous material.

Of the agents which have been used for the isolation of the tubercle bacillus, the most satisfactory consists of a mixture of sodium hypochlorite and sodium hydrate in certain proportions. This reagent, which was introduced by Uhlenhuth[1] in 1908 under the name of "antiformin," causes rapid liquefaction of sputum, pus, and other fluids, and destroys practically all organisms except those of the acid-fast group. The latter, owing probably to their fatty content, are protected from the destructive sterilizing effect of the antiformin, and are found in the deposit which results on centrifugalizing the mixture or allowing it to sediment. Uhlenhuth showed that not only were

[1] Uhlenhuth: *Berl. Klin. Woch.*, lxv., No. 29, 1908.

tubercle bacilli after treatment with antiformin morphologically intact, but that they retained their pathogenic properties and powers of growth. Obviously, such an agent is of great service in isolating tubercle bacilli from the fluids and tissues of mixed infections. By the use of antiformin, Brown and Smith [1] in the case of sputa, and more recently Cruickshank [2] in the case of sputa, urine, cerebro-spinal and joint fluids, have obtained a large proportion of direct cultures. The powerful liquefactive action of antiformin is of the greatest service where the number of tubercle bacilli in any material is small, since large volumes may be treated, and the organisms thus brought together into small bulk by centrifugalization. A large number of writers have spoken favourably of the method in its application to the discovery of scanty tubercle bacilli in sputa from early cases of tuberculosis of the lungs. The technique is comparatively simple, and consists in adding to the sputum or other tuberculous fluid 15 to 20 per cent. antiformin till solution is obtained (shaking is frequently necessary), centrifugalizing the mixture, and washing the sediment several times with sterile water or salt solution. The washed sediment is then inoculated on suitable culture media. The method is also of service in cases where animal inoculation is intended, as the sterilizing effect of the antiformin removes the fallacies which otherwise may result from the presence of a large number of pyogenic organisms. For further details of the method see paper by Cruickshank. Another method of obtaining pure culture, which was introduced by Twort,[3] consists in using ericolin, a glucoside which has a distinctly destructive action on ordinary pyogenic organisms while leaving tubercle bacilli unaltered. This reagent, however, lacks the important liquefactive action of antiformin, and has been found to have only a very limited use. Agents of this kind, because of their selective sterilizing effect, are of the greatest service in aiding the production of pure cultures. The importance of obtaining such cultures directly from infected tissues can hardly be overestimated. The ordinary method of animal inoculation for diagnosis and experiment not only lends itself readily to many fallacies, but it is difficult of application, and involves the loss of a considerable period of time. In addition, a study of direct cultures is the only adequate control to animal experiments.

Direct cultivation is, nevertheless, dependent on the use of media capable of giving rapid and certain growth. The medium originally introduced by Koch, and used by him in his investigation on the growth of *B. tuberculosis* was solidified blood-serum. On this medium growth, even under the most favourable circumstances, was slow and

[1] Brown and Smith: *Journ. Med. Research*, xxii. 517, 1910.
[2] Cruickshank: *Brit. Med. Journ.*, November 9, 1912.
[3] Twort: Proc. Roy. Soc. Lond., B, lxxxi., March, 1909.

extremely limited in amount. Considerable advance was made when Nocard and Roux advised the addition of glycerine, and for many years glycerine agar, glycerine serum, and glycerine bouillon, were the culture media most generally employed. Experience has, however, shown that, although these media can be used more or less successfully to obtain growth in subculture, they are of little service for direct culture from infected material. It was not till 1902 that a medium satisfactory for the latter purpose was found. This was the egg medium of Dorset,[1] and was prepared by simply mixing the yolk and white of egg and solidifying at 70° C. The addition of glycerine further improved the medium, especially for the growth of bacilli of the human type. It was very rapidly shown that these media made from egg were superior in all respects to the older culture media, and recent investigations by Park and Krumwiede,[2] Fraser,[3] etc., have substantiated these findings. In the case of direct culture visible growth appears in from ten to twenty days, and may be very abundant; subcultures grow more quickly and abundantly. It has been already noted that these media, combined with the use of antiformin, have given excellent results. Further, egg media have given important information on the types of *B. tuberculosis*. It has been conclusively shown, for example, that the bovine and human types of bacilli differ not only in their effects on animals, but have distinct cultural characters. The human type grows most luxuriously on egg medium containing glycerine, whereas the growth of the bovine organism is distinctly retarded, or it may be completely inhibited. Bacilli from cases of adult pulmonary tuberculosis belong almost exclusively to the human type, whereas those from cervical and abdominal gland infection, especially in children, are of the bovine type.

Other media in addition to egg have also given satisfactory results. Frugoni[4] has shown that the lungs and other organs of the rabbit, when soaked in glycerine salt solution for one hour, sterilized for three-quarters to one hour at 120° C., and then supported over glycerine bouillon so that the tissue just touches the surface, form excellent media for the cultivation of the tubercle bacillus. Under suitable conditions growth probably occurs more rapidly on Frugoni's medium than on any other. Further, owing to the moist nature of the cultures on the animal tissues, these are more useful than those on egg for the production of emulsions for use in vaccine-therapy or opsonic work. Further developments in the direction of suitable culture media may be expected. It has been shown that the growth of leprosy bacilli is

[1] Dorset: *American Medicine*, iii. 555, 1902.
[2] Park and Krumwiede: Collective Studies, Research Laboratory, Department of Health, New York, vol. v., 1910.
[3] Fraser: *Journ. Exper. Med.*, November, 1912.
[4] Frugoni: *Central. f. Bakt. u. Parasitenk.*, (orig.), liii. 553, 1910.

greatly accelerated by the addition of certain amino-acids to media, and acting on this knowledge amino-acids or fluids containing them (*e.g.*, autolyzed placenta extract) have been tried for the culture of tubercle bacilli, and exceedingly satisfactory results have been obtained.

MIXED AND SECONDARY INFECTIONS IN PULMONARY TUBERCULOSIS.

By J. A. D. RADCLIFFE,
M.B.,
Pathologist to King Edward VII. Sanatorium, Midhurst.

At a comparatively early period in bacteriology it was noticed that the tubercle bacillus was not the only micro-organism present in the sputum of consumptive patients, and this led to the belief that many of the symptoms of pulmonary tuberculosis might be caused by the activities of these other microbes, rather than by the tubercle bacillus itself. The course of the disease, sometimes slow and chronic, sometimes rapid, the acute relapse followed again by apparent arrest, the variability of the temperature and general condition, all seemed to point to a multiplicity of causes rather than to a clinical entity due to the action of one variety of micro-organism. Indeed, Koch[1] himself, in his classical paper on the etiology of tuberculosis, had shown the occurrence of micrococci in a case of miliary tuberculosis of the lung, and had pointed out that such "mixed infections"—a name applied by Brieger and Ehrlich[2]—are not at all uncommon.

Before, however, considering the question of the microbes which may complicate pulmonary tuberculosis, it is necessary, as Bulloch[3] insists, to form a clear conception of what is meant by the terms "mixed infection" and "secondary infection." The term "mixed infection" is applied to the condition in which more than one kind of microbe invades the body at the same time, whereas in "secondary infection" one microbe precedes the other in point of time. The latter must be by far the most important in pulmonary tuberculosis, and it is this condition which is generally meant when either of the terms is used. We have very little knowledge of any simultaneous invasion of the tissues by the tubercle bacillus and any other microbe.

[1] Koch: "Die Aetiologie der Tuberkulose," *Mittheilungen aus dem Kaiserl. Gesundheitsamt*, Bd. ii., 1884.
[2] Brieger und Ehrlich: "Beiträge zur Lehr von der Mischinfection," *Zeitsch. f. Klin. Med.*, xi., 1886.
[3] Bulloch: "Mixed and Secondary Infections," Allbutt and Rolleston's "System of Medicine," vol. v., p. 377, 1909.

In connection with the question of mixed and secondary infections, it is unnecessary to consider those cases in which, to a tuberculosis of the lung, is added a second disease, with well-marked features dominating the clinical picture—*e.g.*, typical lobar pneumonia or influenza—because such cases are really intercurrent infections, and have nothing to do with the point at issue, which consists in determining how far a secondary infection is an etiological factor in the progress of the tuberculous disease and in the symptomatology of acute and chronic pulmonary tuberculosis.

The great difficulty encountered in any bacteriological investigation of this problem is the fact that saprophytic organisms may exist and multiply in the contents of a tuberculous cavity in the lung without playing any part in the pathological condition; and also, what is still more important, that virulent pathogenic bacteria may exist in the mouth and upper air-passages of healthy persons without producing any disease. On this account there is a great difference of opinion among writers as to whether an examination of the sputum can be relied upon to give sufficient information on which to form an accurate estimate of the pathological progress in the lung. For instance, Schröder and Mennes,[1] Sata,[2] and Schabad,[3] believe that no great significance can be placed on the examination of sputum, whereas Kitasato,[4] Cornet,[5] Sorgo,[6] Spengler,[7] and others, believe that, when certain precautions are taken in the examination, the sputum is a reflection of the process in the lung.

On the clinical side, also, the greatest difficulties are met with in deciding whether any part of the clinical picture must be ascribed to the work of secondary infections. For instance, the hectic intermittent fever, so frequently associated with advanced pulmonary disease, is by some authors regarded as the expression of a secondary infection with streptococci, whilst others regard the same type of fever as being due to the tubercle bacillus alone. A striking point in this connection is the rarity with which definite septic processes are met with in the course of pulmonary tuberculosis, even when the hectic stage has persisted for a long time.

After the appearance of Kitasato's work numerous investigations

[1] Schröder und Mennes: "Über die Mischinfection bei der chron. Lungentuberculose," Bonn, 1898.

[2] Sata: "Über die Bedeutung der Mischinfection bei der Lungenschwindsucht," Jena, 1899.

[3] Schabad: "Mischinfection bei Lungentuberculose," *Zeitsch. f. Klin. Med.*, xxxiii. 476, 1897.

[4] Kitasato: "Gewinnung von Reinculturen der Tuberkelbacillen und anderer pathogener Bakterien aus Sputum," *Zeitsch. f. Hygiene*, xi. 441, 1892.

[5] Cornet: "Die Tuberculose," Wien, 1907.

[6] Sorgo: "Über die Sekundärinfektion bei Tuberkulose," *Wien. Klin. Woch.*, xxvi., 725, 1904.

[7] Spengler: "Über Lungentuberkulose und bei ihr vorkom Mischinfection," *Zeitschr. f. Hygiene*, xviii. 343, 1894.

were carried out on similar lines, but on the whole the results were inconclusive. The sole fact established by a large amount of work seems to be that we know that secondary bacteria can be cultivated from the sputum, and occasionally from the lung tissue. Whether or not these organisms play any part in the course of the disease or in the toxæmia is quite unsettled by these earlier investigations.

Another series of researches has approached the problem in a different way. In these experiments the opsonic index has been used as a guide in determining the presence or absence of a secondary infection. Working on these lines, Wirths[1] finds that the pneumococcus is an extremely frequent invader, opsonic index fluctuations to this organism occurring in 75 per cent. of his cases. On the other hand, the striking feature of Inman's[2] work has been the frequency of occurrence of the *Micrococcus pneumoniæ* of Ortner. (This organism is not the pneumococcus.) Both these observers, however, conclude that the tubercle bacillus is the most important factor in the majority of cases. This conclusion is certainly supported by the results of vaccine-therapy on the fever of advanced pulmonary tuberculosis. As a rule this treatment is without effect, but occasionally a striking success is obtained. In this respect my own work[3] does not differ from that of other observers.

In consequence of these disappointing results, it became necessary to investigate the question more thoroughly from the bacteriological standpoint, and many procedures have been suggested for this purpose; but I wish here to draw special attention to the method devised by Sorgo,[4] as the results obtained by his technique differ very much from those obtained by the oldest methods, and show that secondary infections are relatively uncommon. In this way an explanation of the apparent failure of vaccine treatment is forthcoming. Sorgo's technique consists in a very thorough washing of the sputum, twenty or more changes of sterile saline being used for each specimen. During this washing the sputum is gradually broken up into very minute flakes. Cultures are then made in the ordinary way, using a large number of tubes and plates. Space will only permit of a brief summary of results. It may be best to state briefly my own results[5] when using Sorgo's method, but it is impossible here to enter into any discussion of the merits or possible demerits of the procedure. The patients examined

[1] Wirths: "Opsoninuntersuchungen, betreffend die Bedeutung der Mischinfection bei der chron. Lungentuberkulose," *Beit. zur Klinik der Tuberk.*," Bd. xii., Heft 1, 1909.

[2] Inman: "A Contribution to the Study of Secondary Infections in Pulmonary Tuberculosis," *Lancet*, p. 975, 1912.

[3] King Edward VII. Sanatorium Annual Reports, 1908-09, 1909-10.

[4] Sorgo: "Über die Mischinfektion bei Lungentuberkulose," *Zeitsch. f. Klin. Medizin*, Bd. lxi., Heft 3 and 4; and *Zeitschr. f. Tuberkulose*, Bd. vi., S. 335.

[5] Weber-Parkes Prize Essay, 1912.

had all been in residence in a sanatorium for some weeks, and were all febrile. None, however, were the subject of an intercurrent affection, and serious complications of a tuberculous nature were also absent in every case. In fact, the cases observed represent, as far as possible, the ordinary type of febrile consumption. Thirty-three cultural examinations have been made from the sputum of twenty-two patients. Of these twenty-two patients, seventeen gave entirely negative results in the cultures as far as the growth of secondary bacteria is concerned, and from each one a pure growth of the tubercle bacillus was obtained on suitable culture media. In two cases I was unable, from various causes, to come to any conclusion. In three cases definite evidence of the presence of a secondary infection was obtained, and pure cultures of the infecting organisms developed—viz., in two *B. influenzæ*, and in one *Streptococcus pyogenes*.

On the basis of these and similar bacteriological studies, we are justified in concluding that the tubercle bacillus plays the principal part in pulmonary tuberculosis, even when the cases are in an advanced hectic state, and that it alone is competent to, and frequently does, produce every phase in the complicated picture of pulmonary tuberculosis. It is equally clear, however, that secondary infections do occur occasionally, but the prognostic significance of such infections and the best means of dealing with them are matters which must be decided by the results of future work.

PERSONAL OPINIONS.

TUBERCULOSIS DISPENSARIES AND TUBERCULINS.

By E. H. R. HARRIES,

M.D. (STATE MED. LOND.), D.P.H. (LIV.),

Tuberculosis Officer for Monmouthshire, King Edward VII. Welsh National Memorial Association.

The provision under the National Insurance Act of "Sanatorium Benefit" for insured persons necessitates comprehensive schemes all over the country to deal with tuberculosis. In all these schemes the "dispensary" must play an important part. The word "dispensary" in this connection has the sanction of usage, but the Welsh National Memorial Association substitutes the term "Institute." This, I think, is preferable. "Dispensary" to the lay mind implies curative measures and nothing more. "Institute" suggests a wider field of activity. Curative measures, while important, should take a subsidiary place in the general scheme.

Attacks upon endemic disease with a syringe are bound to fail. The plan of action must be much more comprehensive. Education of the people, and more particularly the people's children, must be co-ordinated with simultaneous efforts of the Sanitary Authority to improve the physical environment. Typhus in Liverpool has been practically eradicated by sanitation alone, but at the same time all those actually stricken have been prevented from infecting others.

The tuberculosis dispensary, or institute, becomes the base of operations in the district. In wide areas subsidiary visiting stations are necessary. It is not feasible for patients to travel any considerable distance. In close proximity to the central institute should be available hospital beds. Into these can be received patients requiring observation, and also, but separated from the former, patients in an acute stage of the disease, whose home conditions do not permit of satisfactory domiciliary treatment. Always with the co-operation of the doctors in the district, the institute deals in the best available way with the cases sent. Diagnoses have to be made or confirmed, contacts examined, and the home conditions looked into. The method of procedure in each particular case has then to be decided.

For insured persons four kinds of treatment are indicated by the

Commissioners—viz., (1) sanatorium; (2) hospital; (3) dispensary; (4) domiciliary.

A large proportion of those cases selected for dispensary treatment are ambulant cases, suitable for tuberculin inoculation. But the administration of tuberculin is after all a minor function of the dispensary. On the other hand, the danger has to be guarded against of the dispensary becoming a mere distributing bureau. It must be prepared to grapple with the problem of eradication of tuberculosis by all methods, preventive and curative. "After-care" must largely be organized by the institute with voluntary help, and in time it should become a local centre of information upon the disease in its medical and sociological aspects.

With regard to tuberculin treatment, the fact that so many workers get equally good results with numerous varieties of tuberculin shows, I think, that the particular kind matters little. What is important is to learn the characteristics of some one or two varieties thoroughly and to stick to them.

There is still considerable difference of opinion as to dosage, the rapidity of increase, and the significance of reactions. Probably in time a happy medium will be reached by the opposed schools. I believe, however, that it is easy to produce a great degree of tolerance to tuberculin without any corresponding immunizing response. The patient feels well, but his lesion goes smouldering on. Hence the great importance of frequent careful physical examinations during a course of tuberculin treatment.

THE TREATMENT OF PULMONARY TUBERCULOSIS BY "ARTIFICIAL PNEUMOTHORAX."

By J. W. LINNELL,
M.B., B.C.,
Medical Superintendent, Mount Vernon Hospital for Consumption, Hampstead.

I FEEL a good deal of diffidence in giving an opinion on the value of the artificial production of pneumothorax in cases of pulmonary tuberculosis. An experience based on its use in the treatment of some ten cases only would seem too small to warrant one to be at all dogmatic on the subject. I venture, however, in accordance with the Editor's wishes, to put on record a few conclusions at which I have arrived

since I first started treating cases by this method some eighteen months ago.

In spite of a limited experience, I should like to say at once that I have already seen enough to convince me that this method of treatment is of undoubted value in certain carefully selected cases, and that I believe the field of its application will probably be far more widely extended in the near future.

In my opinion, one of the greatest advances in the treatment of febrile pulmonary tuberculosis was the adoption of the "absolute rest" treatment. The rationale of this mode of treatment depends on an attempt to limit in some degree circulation through the diseased area, and thus reduce as far as possible harmful auto-inoculation. Surely it is a still further advance if one can with comparative safety secure that the larger part of the diseased area be to all intents and purposes cut off from the circulation altogether. Again, everyone knows the extreme importance of local rest in the treatment of tuberculosis in other parts of the body—*e.g.*, the joints; surely it is as logical a procedure to "splint" the lung and secure its immobilization. There are, of course, other advantages to be expected from such a mode of treatment—*e.g.*, the collapse of cavities, with the expression of their purulent contents, followed by a diminution in the amount of expectoration, and consequently a lessened risk of infection of the larynx and intestinal canal; but such points have been discussed in full by other and more experienced workers, and so there is no need for me to do more than give them passing mention, and add that already, in my short experience, I have seen persistent temperatures fall to normal, all signs of toxæmia vanish, and sputum diminish most remarkably within a short time from the commencement of treatment.

A point which strikes me as well worth mentioning is the difficulty one may meet with at the present time in obtaining suitable clinical material for the treatment. Consumptives notoriously look upon their disease in a most light-hearted manner; physicians with no special knowledge talk far too glibly of consumption being an eminently curable disease (so it is, inasmuch as nearly every one of us has been infected at some time or other without knowing it, and has recovered; but the more one sees of the disease when developed to such an extent as to label the infected subject "a consumptive," the more one is inclined to regard consumption as being an eminently incurable disease!). When once patient and physician can be got to look upon consumption as a desperately serious disease, the more willing will both be for the comparatively slight risk incurred by the operation to be cheerfully undertaken, and the necessarily prolonged course of treatment to be earnestly persisted with, should such a mode of treatment be indicated.

The question of the suitability of cases I do not propose to discuss;

it has already been fully dwelt upon by other and more experienced workers. In any case, there is, unfortunately, only a limited field for its use, as contra-indications are present in the majority of cases of pulmonary tuberculosis. In spite of this fact, I would merely reiterate my conviction that many more cases should be subjected to this mode of treatment than have been heretofore, and add that in future it may well be that many cases showing physical signs of early unilateral disease will be treated in this manner.

As regards the operation, I would merely say that, when once a "pocket" has been secured, it is an absolutely easy operation, the apparatus is simple and not expensive, and patients soon become extraordinarily tolerant in every way. At the present time some of my old patients, who have had a pneumothorax produced in hospital, run up to see me every three weeks or so for a "refill," wait about an hour for observation, and then go back home by tube, tram, etc., without experiencing any bad effects whatever.

As to possible complications resulting from the operation, I should like to point out one which I have seen happen more than once, and to which little attention, I believe, has been drawn in current literature on the subject: *i.e.*, a tearing of the visceral pleura, with the causation of a pneumothorax from within—a consummation not to be desired in view of the risk of pyopneumothorax resulting.

In conclusion I would again say that I am convinced of the value of "artificial pneumothorax" in certain selected cases; that in my opinion the area of its use may well be considerably extended; and add that it is my belief that better results may be expected from a combination of pneumothorax and tuberculin sanely administered than from pneumothorax alone.

INSTITUTIONS FOR THE TUBERCULOUS.

ROYAL HOSPITAL FOR DISEASES OF THE CHEST, LONDON.

It is generally recognized by those who follow the trend of medical affairs in this country that a new era has dawned, in which it behoves those who direct the welfare of our hospitals to see that they are guided into those channels which can best meet the new demands. A crisis has arisen when, for the first time in this country, medicine comes into direct relationship with those powerful forces of State and municipality. It is necessary for those institutions which are to survive the refining process of progress to maintain or advance their spheres of usefulness, to reorganize themselves, so as to take their proper places in the wake of the tidal wave generated by those great forces.

History shows us that any institution, however renowned may have been its past, which does not bend to the living needs of the times, must eventually crumble. Hence it will be a wise Council which, while proud and jealous of the reputation of its hospital, shall yet make a just estimate of its strength, and recognize the immediate necessity of reorganization so as to deal effectively with the new situation which has arisen. The wash of these great tidal waves has (shall we say by chance?) come first up against the hospitals for diseases of the chest, in their relationship to the campaign against tuberculosis; and so meanwhile all eyes have been directed towards them.

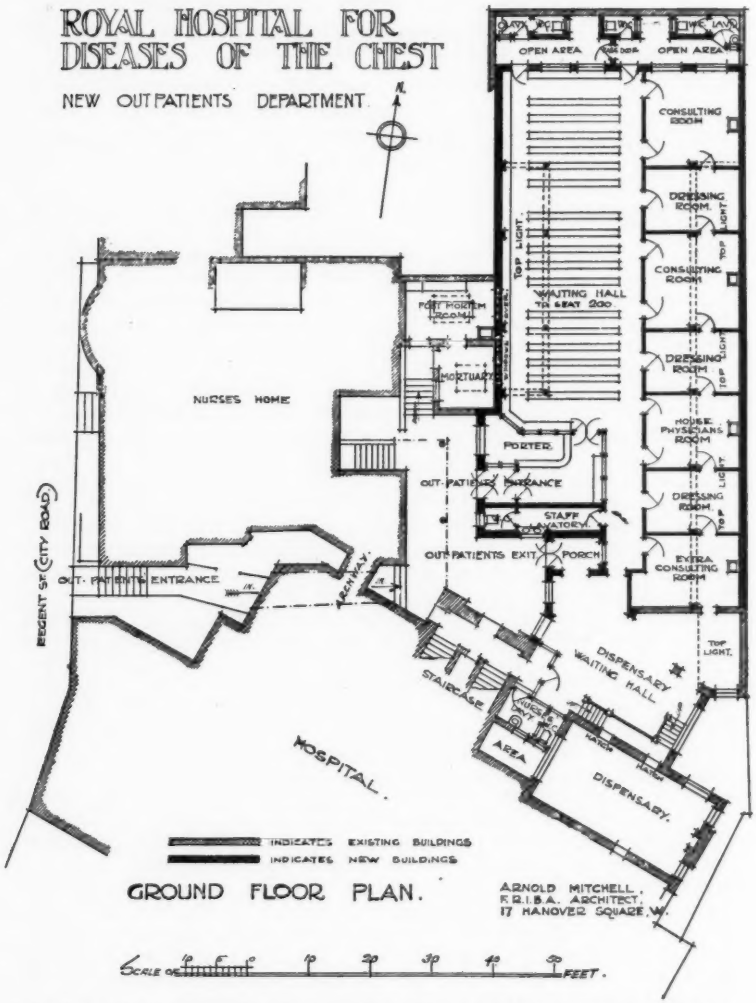
When one takes into account the fact that the Tuberculosis dispensaries or departments for the prevention of consumption will have to deal with all forms of tuberculosis, one must realize the great importance of our hospitals, general and special, establishing them, if they wish to make adequate provision for teaching and research.

The Council of the Royal Hospital for Diseases of the Chest, which was founded in the year 1814, having recognized over twelve months ago what ought to be their duty in relation to the fight against tuberculosis, set themselves to the task of equipping their hospital to meet the demands. Accordingly, they have entirely rebuilt their out-patient department, providing accommodation for a department for the prevention of consumption, X-ray, and electro-cardiographic departments. A research laboratory and lecture hall has also been added to the new building, and the former has been thoroughly equipped with the most modern instruments for diagnosis and research.

A medical school for diseases of the chest has been founded to give a thorough course of practical instruction, not only for those who wish to qualify as tuberculosis medical officers, but also for all those who wish to obtain special knowledge of diseases of the chest.

In addition, a training school for tuberculosis nurses has been

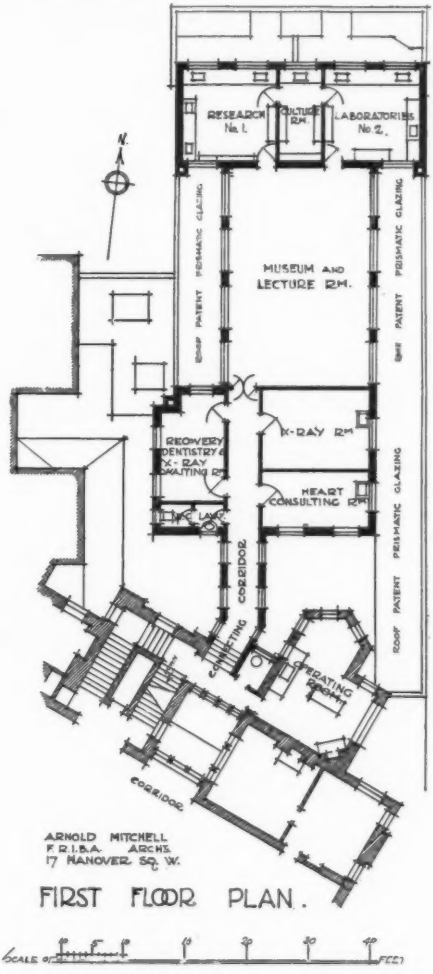
established, which will provide theoretical and practical instruction in tuberculosis. The hospital may yet become a centre for dealing with tuberculosis amongst school-children.



PLAN OF THE OUT-PATIENT AND NEW TUBERCULOSIS DEPARTMENTS OF THE ROYAL HOSPITAL FOR DISEASES OF THE CHEST, LONDON.

The centenary of the hospital will be celebrated in 1914, and it is hoped that by that time funds will be forthcoming to provide for one hundred additional beds. These are a great need at the present time,

and it is the sincere wish of all those who are interested in the welfare of the hospital that the money will be obtained to provide these beds,



PLAN OF NEW MEDICAL SCHOOL, SHOWING RESEARCH LABORATORIES, LECTURE HALL, X-RAY, ELECTRO-CARDIOGRAPHIC DEPARTMENTS, ETC.

and so enable it to carry on the work which has now been begun. It is a cause which must appeal to men and women in every class of society.

D. Barty King,

Dean of the Medical School of the Royal Hospital for Diseases of the Chest, London.

NOTICES OF BOOKS.

THE PREVENTION OF TUBERCULOSIS IN GERMANY.

THE Annual Report of the German Central Committee for the Prevention of Tuberculosis[1] is a publication that demands and repays careful study from year to year. The last Report, which brings the material up to the spring of 1912 and was laid before the General Meeting in Berlin on June 14, displays that orderly presentation of facts which invariably characterizes Professor Nietner's work. It offers, however, much more than a mere list of details regarding the progress of anti-tuberculosis efforts since last year, for the Report contains many special features of interest quite apart from these. It includes, for example, a series of extracts from the reports of medical directors of sanatoria, and the account of experiences with various kinds of tuberculin, etc., forms very interesting reading. The main headings are as follows: I. The Detection, Selection, and Grouping of Cases. II. The Disposal of Patients in Sanatoria and Kindred Institutions. III. The Problem of Advanced Cases. IV. Prophylactic Measures against the Spread of Tuberculosis. V. Present Stage of Progress in the German Empire. VI. The Treatment of Lupus. It will not be possible to give here a comprehensive résumé of this voluminous and important Report. Only a few, therefore, of its more noteworthy features will be dealt with, and amongst these the state of compulsory notification in Germany, the rapid development of the dispensary system, the selection of suitable cases for sanatoria, and the rôle played by the Invalidity Insurance Institutions in a national campaign against tuberculosis claim special attention. Interesting information is given respecting *Notification of Tuberculosis*. Compulsory notification is still wanting in completeness. In Prussia and some other States only *deaths* are notifiable. The National Liberal party recently presented a resolution to the Government embodying their unanimous views as to the urgent necessity for an Imperial Compulsory Notification Law, but it failed to achieve its object. In Germany only the so-called *Volksseuchen* (plague, cholera, small-pox, leprosy, typhus, etc.) are notifiable throughout the Empire. It has been urgently demanded that tuberculosis be included in this list of pestilences. This would insure uniformity of action and render possible a more consistent preventive policy. Another point on which stress has been laid is the necessity for *Leichenschau* (*i.e.*, the inspection of the dead) by qualified practitioners. So long as this formality is relegated to lay officials, many deaths from tuberculosis will escape registration. Here and there the inspection of dead bodies by medical men is enforced. But until it is

[1] "The Annual Report of the German Central Committee for the Prevention of Tuberculosis." By Professor Nietner, General Secretary to the Central Committee. Published by the Deutsches Zentral Komitee zur Bekämpfung der Tuberkulose, Link Strasse 29, Berlin, W., 9. Pp. 170. With six illustrations and a supplement containing lists of all the tuberculosis sanatoria and other institutions, and tuberculosis associations and dispensaries in the German Empire.

compulsory throughout the Empire tuberculosis mortality statistics will remain incomplete, and cannot be taken as entirely trustworthy. At the present moment, mortality statistics referring to contiguous localities which present almost identical social features often display curious discrepancies. *The Dispensary Movement* is making rapid progress. The sanatorium is now no longer the central idea in anti-tuberculosis effort in Germany. The dispensary (*Auskunft und Fursorgestelle*) has not superseded the sanatorium, but has stimulated a parallel activity that is claiming more serious consideration every year. As Nietner remarks in his Report: "The more the belief gains ground that the tuberculous subject, his family, and his environment are one and indivisible, the more will the idea of the dispensary grow in importance in all preventive schemes." In the Report laid before the General Meeting in 1906 the number of dispensaries had only reached 72. Their number is now 1,400. But it is not their number alone that calls for remark. Of far greater importance is the fact that they meet everywhere with official recognition and support. Alone the fact that the 31 Invalidity Insurance Institutions regard them with favour and support them financially has a profound significance. It must be borne in mind that the Invalidity Insurance Institutions are not philanthropic boards. Their humane activities are organized upon a sound economic basis. It is the very essence of their policy that they should foresee and forestall permanent invalidity as far as possible. But they may not expend large sums on preventive schemes if the sums so expended bear no logical proportion to the sums that might otherwise have been expended on pensions to permanent invalids. An insured person with advanced open tuberculosis is not likely to impose a very long charge on the invalidity insurance funds. But an advanced case of open tuberculosis is a source of danger to other insured members of his family, and the quicker this danger is headed off the better for the invalidity insurance funds. It is, therefore, interesting to find the insurance institutions energetically countenancing the establishing of new dispensaries, for this affords incontrovertible proof that dispensaries "pay" from the point of view of the invalidity insurance boards. Apart from the invalidity institutions, the dispensaries are largely recognized and supported by the federal governments and by local authorities. This is notably the case in Bavaria, Saxony, Würtemberg, Baden, Hesse, and Birkenfeld. The work of organizing dispensary systems to cover scattered rural districts has also gone apace, and in some parts of the country the net of the dispensaries is so close-meshed that the smallest village in lonely moorland tracts comes within the scope of its operations. In the city the tuberculous person comes voluntarily to the dispensary, for the dispensary is now a recognized social institution. In the country new ideas progress haltingly, and it is necessary to ferret out the tuberculous subject with skill and tact. This work is best entrusted to specially trained village nurses. The rural school doctors have it in their power also to render valuable assistance in work of this nature. The Silesian Provincial Association for the Prevention of Tuberculosis has organized an admirable scheme for the special training of rural district nurses. These came to Breslau for a ten days' training course. The pupils attend at the dispensaries, accompanying the town nurses on their domiciliary rounds, are instructed in case-taking and in the

keeping of records and are taught the essential principles underlying their work. Ten days may seem a very short training period, but it should suffice when the training is given to women already experienced in district visiting and village nursing.

A "Special Commission for the Further Development of the Dispensary Movement in Germany" was formed some time ago as an offshoot of the Central Committee, and held its first Annual Conference in May, 1911. Professor Gaffky, Director of the Robert Koch Institute for the Study of Infectious Diseases, is the President of the Commission. *Observation Stations* are steadily increasing. It is one of the most important functions of the dispensaries to detect suitable cases for sanatorium treatment. This duty they share with the various polyclinics, of which there are forty-four in Germany. These do not include the polyclinics attached to Universities, which form such an important feature of German medical training. The main point of difference between the polyclinic and the dispensary is that the polyclinics treat their patients while the dispensaries scrupulously avoid giving specific treatment and particularly desire to draw the local general practitioners into collaboration. Some of the polyclinics maintain a few beds in which doubtful cases may be temporarily accommodated for more thorough diagnosis. To quote the Report: "A large number of sanatoria are undoubtedly hampered by the circumstance that patients are sent to them who are not appropriate sanatorium cases, either because there is no active tuberculosis present or because the disease has already advanced beyond a stage where a cure and a subsequent restoration to wage-earning capacity is humanly possible. Such patients encroach upon the beds more appropriately occupied by other persons, forcing these to observe a more or less prolonged waiting period in their own homes, often both to their own detriment and that of their families." To meet this difficulty special preliminary observation stations (*Vor und Beobachtungs-Stationen*) have been established which are separate from the sanatoria. They are partly incorporated with dispensaries, as in Remscheid; with polyclinics—*e.g.*, the Berlin Universitäts-Klinik; or with hospitals, as in Trier and in Silesia.

Some of the invalidity insurance institutions have organized and maintain their own observation stations—*e.g.*, Hansa-städte, Berlin, and Silesia. The Silesian Invalidity Insurance Institution reports as follows: "In 1911, 756 insured applicants for sanatorium benefit passed through the twenty-four observation stations of the Schlesische Landes-Versicherungs-Anstalt: 469 were rejected as too advanced, and 80 were rejected as inactive cases; 20 from other reasons. In the observation station attached to the Breslau Insurance Hospital, 774 insured came under observation: 476 were accepted for sanatorium benefit, 142 rejected as too advanced, and 126 as inactive; 30 from other reasons. Finally, in the second Breslau observation station, 975 insured out-patients came under examination as sanatorium applicants; 674 cases were sent to sanatoria and 301 were rejected." In Silesia, therefore, the Invalidity Insurance Institution in one year weeded out 886 cases from the 2,505 who were recommended for sanatorium treatment. The Berlin Invalidity Insurance Institution has its own observation station at Lichterberg, from which appropriate cases are sent to Beelitz. The average stay in the station was eleven days; the average

gain in weight was 2 kilos. The rejected candidates are required to present themselves for after-examination at half-yearly intervals. In 1911, 8,895 persons were examined and 3,170 were admitted to Beelitz (1,797 men and 1,373 women). Insured persons are only entitled to curative treatment in a sanatorium or hospital if there exists a reasonable expectation that the treatment given will restore the patient to a wage-earning capacity within the meaning of the Invalidity Insurance Act. Provided this expectation is justified, patients in any of the three so-called "Turban-Gerhardt Stages" of tubercular disease may be admitted for treatment. To quote the medical director of the Ronsdorf Sanatorium belonging to the Invalidity Insurance Institution of the Rhine Provinces: "While each case for admission must be judged on its own merits, the first condition must be that sanatorium treatment is absolutely necessary, and the second that there exists reasonable hope of its having a successful issue." The Turban-Gerhardt classification has been adopted by the Kaiserliches-Gesundheits-Amt and by the International Conference on Tuberculosis, and is largely employed in the drawing up of statistics relating to sanatorium results. It must be remembered that all German "cure" statistics dealing with insured patients are drawn up on a strictly defined economic basis. A sanatorium "cure" implies that the discharged patient has regained a wage-earning capacity within the meaning of the Act. The Invalidity Insurance Act defines an invalid as "a person who, working at the trade for which his training and equipment fit him, is not capable of earning *one-third* of the wage which other persons in the same locality who are working at the same trade, and are similarly trained and are mentally and physically sound, are accustomed to getting." The Turban-Gerhardt classification is as follows: *Stage I.:* Disease limited to small patches in one lobe; where both apices are affected the disease does not extend beyond the scapular ridges and the clavicles; where only one apex is affected, it does not extend forwards and downwards beyond the second rib. *Stage II.:* More extensive than Stage I., but involving, at the most, the whole of one lobe; or, if the disease is more virulent, not extending beyond the half of one lobe. *Stage III.:* All cases extending beyond Stage II., and all cases exhibiting a considerable degree of excavation. "Stage O" is employed for indicating cases after treatment where Stages I. to III. are no longer demonstrable. Reference must be made to the increasing *number of sanatoria* in Germany. There are now in Germany 312 establishments for pulmonary consumptives and other invalids. Of these, 91 belong to the Invalidity Insurance Institutions. They include 37 sanatoria for pulmonary consumptives, 38 convalescent homes, etc., 15 homes for incurables, and 1 forest camp. The remainder of the 312 establishments include 64 Volkheilstätten, 39 Lungenheilstätten, 22 Kinderheilstätten, and 96 forest camps. In 1911 the Invalidity Insurance Institutions found accommodation in their own institutions for 48 per cent. of their insured patients. There are now in Germany approximately 14,000 beds for adult pulmonary consumptives. For tuberculous children 21 institutions provide a total of 1,352 beds, and there are 100 institutions, containing a total of 8,644 beds, for children who are scrofulous and anæmic. A note must be given to *lupus*. Much attention is now being devoted to lupus, and the Invalidity Insurance Institutions are also active in facilitating the treatment of insured cases.

One hundred and ninety insured persons suffering from lupus received special treatment in 1911. There is a special Lupus Commission affiliated with the Central Committee. Several large German towns have inaugurated associations for dealing with this disastrous malady, Hamburg being one of the foremost. Dr. Wichmann, of Hamburg, has recently perfected an apparatus for exposing the mucous surface of the nasal and oral cavities and of the larynx and trachea to the specific action of radium and meso-thorium. Lastly, a note on the *Financial Report*. The Central Committee had 1,469 members at the beginning of the year. Their subscriptions amounted to £1,770. The State gave a grant of £3,000. From these and other sources, and including £10,000 in hand, the Committee had the sum of £15,823 at their disposal. The expenditure amounted to £8,297. Of this sum, £4,190 were spent on grants to sanatoria and other tuberculosis institutions, and £200 were set apart for the International Tuberculosis Association. The Lupus Commission has a separate account. In the year under review the income amounted to £6,711 and the expenditure was £1,330.

EMILIA V. KANTHACK DE VOSS.

A HANDBOOK FOR TUBERCULOSIS OFFICERS.

Dr. Hyslop Thomson has been well advised to issue a second edition of his practical manual on the management of cases of pulmonary tuberculosis.[1] The book is one which should be in the possession of all tuberculosis officers and every medical practitioner undertaking the domiciliary treatment of consumptives. The work has been entirely rewritten and much new matter has been added, but it still retains the characteristics of the first edition which we commended in our former review. It provides, in fact, a concise yet comprehensive study of the present-day problem of dealing with the consumptive as met with in what is called "general practice." The author writes from a long experience of sanatorium life and a study of consumptives in all their manifold aspects. The book is therefore thoroughly practical, and throughout there is the personal note of experience and the well-founded expression of opinions of an expert. We think, however, that in the next edition, if the work is to remain of the greatest service to tuberculosis officers, it will be necessary to provide references to the best in modern literature. The present work is divided into three parts, dealing respectively with diagnosis, prognosis, and treatment. In the latter section a careful exposition is given of modern sanatorium treatment, auto-inoculation, and the administration of tuberculin. There is a good chapter on After-Care and Home-Treatment, and in an Appendix timely counsels are provided regarding the economy of different types of sanatorium construction. The numerous charts and diagrams add much to the interest and value of the book. The type is large and clear, and the volume throughout is well arranged and attractively presented.

[1] "Consumption in General Practice." By H. Hyslop Thomson, M.D., D.P.H., Late Medical Superintendent Liverpool Sanatorium. Pp. xv+335. With charts and diagrams. London: Henry Frowde and Hodder and Stoughton; Oxford Press Warehouse, Falcon Square, E.C. 1912. Price 12s. 6d. net.

MANUALS FOR MEDICAL PRACTITIONERS AND WORKS OF REFERENCE.

Medical practitioners are constantly called upon to advise in regard to the selection of health resorts for tuberculous and other patients. To all such the new work on the Health Resorts of the British Isles, edited by Dr. Neville Wood, will be of the greatest service.[1] Certainly an up-to-date handbook on the lines adopted in this volume was much needed. Attention has been focussed on the principal resorts. Dr. Fortescue Fox deals with the "Natural Mineral Waters of the British Islands, and their Uses"; Dr. Charles W. Buckley writes on "The Practice of Hydrotherapy"; and Dr. Arthur Latham has an all too short article on "Sanatoriums and Sanatorium Treatment in Great Britain." There is a fairly complete list of institutions for consumptives, "where the charge is two guineas a week and upwards." The editor provides a thoughtful section on "International Aspects of British Health Resorts." The descriptions of the various resorts are scarcely uniform. For instance, more than ten pages are devoted to Buxton, while Cheltenham has little more than a page. Still, the accounts given may be considered as authoritative, reliable, and up-to-date. The book has been "prepared with the assistance of an advisory committee appointed by the Council of the Section of Balneology and Climatology of the Royal Society of Medicine." There are several good maps and many illustrations.

In discussing patho-clinical problems of tuberculosis one is soon compelled to face the facts and hypotheses which cluster around the fascinating yet peculiarly perplexing subject of immunity. Dr. Elizabeth Fraser has placed many workers under an obligation by the issue of her concise, lucid, and up-to-date handbook on the subject.[2] The book is one which every tuberculosis officer and all other practitioners dealing with tuberculous subjects will do well to study with care. Opening with a short historical survey, the author passes to a consideration of the body fluids, cells, and micro-organisms as factors in immunity. The rôle of antitoxins, agglutinins, precipitins, bacteriolysins, opsonins, etc., is freely described. Then follow descriptions of immunity reactions employed for diagnostic and therapeutic purposes. There is a good account of tuberculin diagnostic tests. The book affords just the clear, comprehensive, and reliable exposition of the essentials regarding immunity that doctors require if they are to avail themselves of the latest views and method with understanding.

Dr. Cabot is not only a brilliant and experienced teacher of medical students, but he is deeply interested in medico-educational and medico-sociological problems, and fully realizes the importance of providing for the effective post-graduate instruction of practitioners of the healing

[1] "Health Resorts of the British Islands." Edited by Neville Wood, M.D., with the assistance of an Advisory Committee. Pp. xii + 253, with 40 illustrations and 3 maps. London: University of London Press. Published for the University of London Press, Ltd., by Hodder and Stoughton, Warwick Square, E.C. 1912. Price 7s. 6d. net.

[2] "A Manual of Immunity for Students and Practitioners." By Elizabeth T. Fraser, M.D. (Glas.), Late Assistant Bacteriologist, Glasgow Royal Infirmary; Beit Research Fellow. Pp. x + 199. Glasgow: James Maclehose and Sons. 1912. Price 5s. net.

art. In his latest work[1] he has gathered a representative collection of one hundred clinical cases, each of which is graphically portrayed in a word picture which is interesting, informing, and skilfully limned. Then follow discussion of diagnosis, indications for the basis of a sound prognosis, and directions for the ordering of treatment. In purpose, general plan, and completion, the work is excellent, and by the speedy call for a second edition medical practitioners have testified to their appreciation of a volume which must prove invaluable to all who practice medicine. Records of a number of tuberculous cases appear. We are glad to be able to approve Dr. Cabot's remarks regarding the importance of "family history": "Next to character and income, the most important determining factor is the family history. If a parent or near relative has shown great capacity to resist the disease and to transform it into the chronic so-called 'old-fashioned' type of consumption, there is some ground for expecting that the patient will show the same qualities which under the title of 'diathesis' or 'constitution' have long been recognized as of great importance."

Dr. James Mackenzie's fine study of symptoms has, as we expected, speedily reached its second edition.[2] The book is likely to become a classic. It is in a measure a companion volume to Hilton's "Rest and Pain." Certainly no medical practitioner can afford to be without a copy of this luminous work. The book is a complete study of the problem of pain and the nervous phenomena which accompany it. A chapter is devoted to the symptomatology of affections of the lungs and pleura. There is a careful study of the nature of the pain in pleurisy. We hope Dr. Mackenzie will be able to undertake a thorough investigation of the many and varied pains met with in not a few patients the subjects of pulmonary tuberculosis. "Symptoms and their Interpretation" is not a work to be summarized or criticized within the limits of a short notice. Every page bears evidence of deep thought and accurate observation, and presents matter for careful pondering. The book is one which every clinician must read.

Dr. D'Este Emery's handbook on "Clinical Bacteriology and Hæmatology," has now reached the fourth edition.[3] It was originally designed to meet the needs of the busy medical practitioner, and as the work has grown the primary aim has not been forgotten. The fact that three editions have been exhausted since its first appearance in 1902, is sufficient evidence that the book meets a real want. In the present edition all departments have been brought thoroughly up-to-date. The work is one which should be available in every pathological and clinical laboratory. We believe tuberculosis officers and others dealing

[1] "Case Histories in Medicine. Illustrating the Diagnosis, Prognosis, and Treatment of Disease." By Richard C. Cabot, M.D., Assistant Professor of Clinical Medicine, Harvard Medical School. Second edition, revised and enlarged. Pp. 295. Boston. U.S.A.: W. M. Leonard. 1911.

[2] "Symptoms and their Interpretation." By James Mackenzie, M.D., LL.D. (Aber. and Edin.), Lecturer on Cardiac Research, London Hospital; Physician to the Mount Vernon Hospital. Pp. xx+304. London: Shaw and Sons, 7 and 8, Fetter Lane, E.C. 1912.

[3] "Clinical Bacteriology and Hæmatology for Practitioners." By W. D'Este Emery, M.D., B.Sc., Lond., Director of the Laboratories and Lecturer on Pathology and Bacteriology, King College Hospital, and Lecturer on General Pathology, London School of Medicine for Women. Fourth Edition. Pp. x+274, with 10 Plates and 50 Figs. London: H. K. Lewis, 136, Gower Street, W.C. 1912. Price 7s. 6d. net.

with tuberculous cases will find the book of much service, for it contains particulars regarding the examination of sputum, the collection of fluids from the pleuræ, the estimation of the opsonic power of the blood, and the various ways of detecting tubercle bacilli. The appearance of this new edition is timely, and it is a work which can be relied upon with confidence.

Dr. R. W. Allen's work "Vaccine Therapy" has quickly run through three editions; we now welcome the fourth.[1] As indicated in our last review of this work, it is one of the most suggestive and helpful of the many works which have appeared during recent years dealing with the therapeutic and diagnostic use of vaccines. The book, moreover, is written with a grace and lucidity rarely met with in monographs of this class. The work is one which every student of tuberculosis and clinician engaged in the recognition and management of tuberculous cases will find of the greatest service. The section dealing with the vaccine treatment of pulmonary tuberculosis — we wish Dr. Allen would discard the unsatisfactory designation "Phthisis"—is admirable. The charts employed for the registration of physical signs will be approved by many. A clear account is given as to the nature of the infection due to the *Bacillus tuberculosis*, and this is followed by a useful description of the constitution of the tubercle bacillus and of the tuberculins now available for practical work. There is a good section on Auto-Inoculation. Dr. Allen concludes that "there is no tuberculin so well adapted to the treatment of a case as that formed by the affected individual for himself, but I think the wisest procedure would be as follows: (1) Control auto-inoculations by rest, absolute if required. (2) Eliminate mixed infections by means of autogenous vaccines. (3) Raise tolerance by a short course of Old Tuberculin. (4) Proceed to auto-inoculate by means of graduated exercise and work. (5) When these stimuli fail to produce any reaction, recommence tuberculin treatment, perhaps best with the bacillary emulsion; employ the intensive method, and proceed to massive doses, and so endeavour to raise antibacterial as well as antitoxic immunity, and eliminate the bacterial infection. This elaborate method might well prove to be the best yet devised for the treatment of pulmonary tuberculosis."

Mr. John Laird has written an interesting brochure on the treatment of tuberculosis, which is evidently the outcome of prolonged thought and no little clinical experience.[2] The author strongly advocates the use of the following prescription:

℞.	Sodii iodidi	ʒss.
	Sodii benzoatis	ʒiii.
	Liquor arsenicalis	ʒss.
	Tinct. pulsatillæ	ʒi.
	Tinct. baptisiæ	ʒiii.
	Syrup. aurantii	ʒi.
	Aq. chloroformi	ad ʒviii.
	Misce.	

[1] "Vaccine Therapy: Its Theory and Practice." By R. W. Allen, M.D., B.S., Lond., late Clinical Pathologist to the Mount Vernon Hospital for Consumption and Diseases of the Chest. Fourth Edition. Pp. x+444, with Charts. London: H. K. Lewis, 136, Gower Street, W.C. 1912. Price 9s. net.

[2] "Notes on the Treatment of Tuberculosis (Preventive and Curative)." By John Laird, Licentiate of the Royal Colleges of Surgeons and Physicians, Ireland. Pp. 85. Bristol: John Wright and Sons, Ltd. 1912.

The maximum dose for an adult is said to be 2 drachms, but 1 drachm three times a day in water is recommended as usually sufficient. Mr. Laird urges that "it may be used either before or after meals, according to indications, and should be taken perseveringly for a prolonged period, with occasional intermissions for a few days. Should much anæmia be present, the citrate of iron and ammonia can be added to the mixture." Mr. Laird is a great believer in the use of calcium salts. "I conclude that tuberculosis is a preventable disease, and that the best means at our disposal for its prevention lies in our keeping up to full efficiency the calcium contents of the system in infancy, childhood, and adolescence." The glycerophosphate of calcium is the preparation most approved. There are also essays on tuberculosis in childhood, tuberculosis of lymph-glands, bones and joints, abdominal tuberculosis, and the management of cases of pulmonary tuberculosis.

Many doctors, from the necessities of their professional duties, are availing themselves of the advantages offered by the automobile. Not a few invalids, including many consumptive subjects and other tuberculous patients, have received much benefit from the pleasurable open-air life afforded without fatigue by some form of motor-car. The new manual on the so-called "Cycle-Car," convinces us that there is certain to be in the immediate future a rapid extension in the use of small and comparatively inexpensive automobiles. "The Cycle-car Manual" provides in compact form a complete and illustrated monograph on the three and four-wheeled miniature motors of the simplest type which are now becoming increasingly popular.[1] A cycle-car is likely to become a common feature in sanatorium life.

A mid-winter holiday is a most desirable prophylactic arrangement for a hard-worked and much harassed medical practitioner, and for doctors engaged in hospital and sanatorium work it often proves of the greatest benefit. A short vacation devoted to winter sports in Switzerland or Scandinavia accomplishes much in reinvigorating enervated wills and strengthening flagging physical powers. Not a few doctors are now taking up the fascinating sport of ski-ing. The British Ski Association have just issued the first number of their new review *Ski-ing*.[2] It contains full particulars regarding the aims and constitution of the Association, together with a number of articles of interest to ski sportsmen.

Photography affords a recreation and pursuit which is not only of service to many doctors, but provides a desirable interest for consumptive patients. A camera is certainly a much appreciated companion for many a tuberculous case. Messrs. Burroughs Wellcome and Co. issue annually a neat pocket reference-book, a record which only needs to be known to be constantly used. We advise our readers to procure a copy of "The 'Wellcome' Photographic Exposure Record and Diary."[3]

[1] "The Cycle-Car Manual: Cycle-Cars of 1913." Written and illustrated by the staff of the *Cycle-Car*. Pp. xxxii+154. London: Temple Press, Ltd., 7-15, Rosebery Avenue, E.C. 1913. Price 1s. 6d. net.

[2] *Ski-ing*, the Review of the British Ski Association (Hon. Sec., the Hon. E. C. Pery, 3, Upper Woburn Place, Tavistock Square, London, W.C.). London: Horace Marshall and Son, 123, Fleet Street, E.C. 1912. Price 1s.

[3] "The 'Wellcome' Exposure Record and Diary for 1913" is published by Messrs. Burroughs Wellcome and Co., Snow Hill, Holborn, London, E.C. Price 1s. net.

The January issue of *The Practitioner* is a "Special Tuberculosis Number," containing a series of authoritative articles by experts, and relating to all aspects of the Tuberculosis Problem.[1] Among the contributors are Sir T. Clifford Allbutt, Sir Richard Douglas Powell, Sir Alfred Pearce Gould, Sir StClair Thomson, Sir John Moore, Dr. Arthur Latham, Dr. F. Rufenacht Walters, Dr. Marcus Paterson, Dr. Noel Bardswell, Dr. Camac Wilkinson, Dr. William Milligan, Dr. T. D. Lister, and Mr. H. J. Gauvain.[1]

"The Nursing Mirror Pocket Encyclopædia and Diary" for 1913 is a compact little volume which, in addition to its Diary, contains a large amount of information likely to be of real service to all classes of nurses.[2]

Messrs. Evans Sons, Lescher and Webb, Ltd., have issued a serviceable booklet, "Diluted Tuberculins," and in their quarterly, *Evans' Journal*, articles are appearing on "The Use of Tuberculin in Private Practice."[3]

[1] "Special Tuberculosis Number of *The Practitioner*," vol. xc., No. 535, January, 1913. London: *The Practitioner*, Howard Street, Strand, W.C. Price 7s. 6d.

[2] "The Nursing Mirror Pocket Encyclopædia and Diary." Pp. 196. London: The Scientific Press, Ltd., 28 and 29, Southampton Street, Strand, W.C. 1913. Price 6d. net.

[3] For copies of "Diluted Tuberculins" and *Evans' Journal* application should be made to Messrs. Evans Sons, Lescher and Webb, Ltd., 56, Hanover Street, and 1-9, Seel Street, Liverpool, and 60, Bartholomew Close, London, E.C.

PREPARATIONS AND APPLIANCES.

A TUBERCULIN OUTFIT.

TUBERCULIN as an agent in the diagnosis and treatment of tuberculosis is of undoubted value. Unless, however, it is again to fall into disrepute, it is essential that it should be employed with care and precision and a clear recognition of its dangers, contra-indications to its use, and a sound knowledge of its limitations. It is necessary to insist that, if reliable results are to be obtained, the tuberculin employed must

A TUBERCULIN OUTFIT.

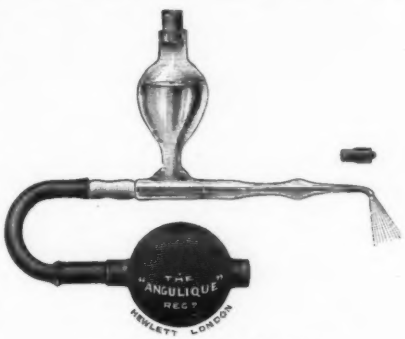
be satisfactory and the technique employed reliable. Messrs. Allen and Hanburys have recently introduced a TUBERCULIN OUTFIT[1] which will be of real service to tuberculosis officers and all medical practitioners

[1] An illustrated circular giving full particulars of the Tuberculin Outfit will be sent to any medical practitioner making application to Messrs. Allen and Hanburys, Ltd., 7, Vere Street, Cavendish Square, London, W. The outfit, ready for hospital and sanatorium use, consists of one drop-bottle each of 1, 4, 16, and 64 per cent. tuberculin, von Pirquet vaccinator, spirit-lamp, and bottle of absolute alcohol, the whole fitted into a mahogany stand. The price is 27s. 6d. net. Tuberculin for the quanti-Pirquet test is supplied in a set of four capillary tubes—one each 1 per cent. (white), 4 per cent. (amber), 16 per cent. (green), 64 per cent. (blue). Price 1s. 6d. net per set.

dealing with tuberculous patients. The chief features of this compact outfit are indicated by the accompanying illustration. There is no doubt but that this excellently-arranged and in every way most satisfactory equipment for the conduct of the cutaneous diagnostic test by tuberculin will become very popular. The apparatus required consists of a spirit-lamp, a scarifier, some alcohol, and four different dilutions of old tuberculin (T.A.)—viz., 64, 16, 4, and 1 per cent. The most convenient scarifier is the platinum spade used by von Pirquet. The skin of the forearm over the brachio-radialis muscle is rubbed with alcohol; the scarifier is held vertically between the thumb and forefinger, and with it four circular holes are drilled in the skin about an inch apart by a rapid twisting movement of the instrument on its long axis. The base of the pits should show vivid pink, but not actually bleed. A drop of tuberculin is now applied to each scarification in turn, the weakest dilution distally (nearest the hand), so that a stronger solution shall not be carried by the lymphatics to a proximal spot. The excess of fluid is sopped up with tiny pieces of sterile wool, and the moist spots left to dry for five minutes or so. The sleeve is then gently replaced, and the patient instructed not to wash the forearm until the next day, to avoid rubbing or irritating it, and to present himself for observation after twenty-four and forty-eight hours. Full particulars as to the estimation of results are provided with each outfit.

THE "ANGULIQUE" SPRAY.

Messrs. C. J. Hewlett and Son have won well-deserved distinction for the variety and excellence of their sprays for nasal, pharyngeal, and laryngeal use. In previous issues we have given descriptions of the "Nebulique," "Vapolique," "Gradulique," and "Super-Nebulique" sprays. We now give an illustration of the latest of these serviceable appliances—the "ANGULIQUE" SPRAY.[1] The apparatus is made of toughened English glass, and is so constructed as to deliver a spray in any direction. It can be used with spirituous, aqueous, or oily solutions. For the application of medicaments to the mucous membrane of nose, throat, or larynx, and for the nebulization of medicated fluids for inhalation, and, indeed, for local applications generally the "Angulique" is to be thoroughly recommended.

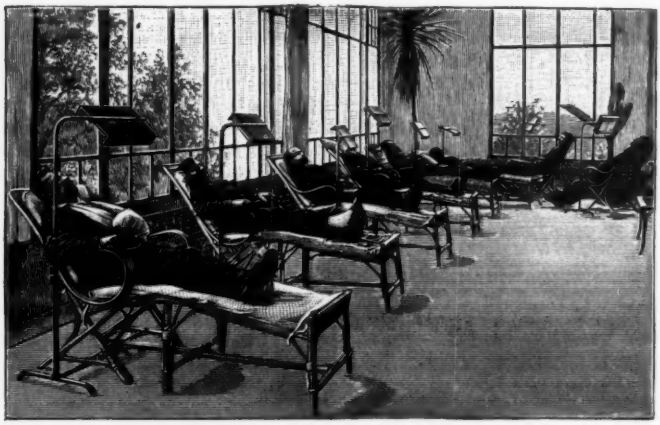


THE "ANGULIQUE" SPRAY.

[1] Full particulars of Hewlett's registered sprays may be obtained on application to Messrs. C. J. Hewlett and Son, Ltd., 35-42, Charlotte Street, and 83-85, Curtain Road, London, E.C. The price of the "Angulique" spray is 5s. 6d.

A NEW BOOK-REST FOR SANATORIUM PATIENTS.

Everyone having experience of sanatorium life, or, indeed, observant of the needs of a tuberculous subject undergoing home treatment, must have realized how tedious many patients find the period of enforced rest. For not a few cases long-continued repose in the horizontal position is essential. This is particularly the case with many patients suffering from some form of so-called "surgical tuberculosis," as, for instance, tuberculous disease of the spine. For all such patients the new "PAUMA" BOOK-REST will prove a veritable boon.[1] Its essential features and method of use will be seen from the accompanying illustration. It may be said at once that the "Pauma" is the result of a



THE "PAUMA" BOOK-REST.

real patient's experiments. It is an ingenious contrivance which provides a strong, easily-adjusted, thoroughly effective reading-stand, which holds a book, magazine, or paper, in any desired position, and allows of the pages being turned easily and rapidly with one hand. The book-rest proper is mounted on a metal tube by two flanges fixed to its back, and can be moved to either right or left, or revolved, and then firmly fixed as required. We believe that the "Pauma" only requires to be known to be thoroughly appreciated.

EQUIPMENT FOR OPEN-AIR TREATMENT.

The open-air treatment of tuberculosis has proved the most effective of methods for fighting the Great White Plague. But it cannot be denied that an open-air life, when carried on under such climatic conditions as have to be faced in this country, is not without its real

[1] The "Pauma" Book-Rest is manufactured by the patentees, Messrs. Édouard Dubied and Co., of Couvet, Switzerland. The British depot is under the direction of Mr. J. O. Bennett, Queen Buildings, Rutland Street, Leicester.

difficulties. Much, however, of the disadvantage and discomfort can be overcome, or at least minimized, by the adoption of judicious measures. And foremost among these we would place hygienic clothing. Among firms that have made a speciality of rational personal equipment for the open-air life, the great house of Burberrys stands foremost.[1] This firm has brought science and art to bear on the provision of water- and weather-proof materials and clothing both for the healthy and the invalid. Their cloths are scientifically designed and skilfully prepared by processes of their own, so that "a Burberry" can now be relied upon as an effective and properly ventilated protector against rain, sleet, mist, and wind, a maintainer of warmth, and a comfortable, smart, and durable over- or top-coat. The extension of the business of Burberrys has been remarkable, for in addition to their wholesale and retail establishments in London, Paris, and Basingstoke, they now have houses in New York, Buenos Ayres, and Montevideo, and agents, not only in nearly every British town, but in almost every important centre throughout the world. A splendid new house for the Metropolis has recently been opened in the Haymarket, and our readers would be well advised to pay it a visit at their earliest convenience, and examine for themselves the many varieties of "Burberry" now available for all sorts and conditions of men, women, and children.

OPOTHERAPY IN TUBERCULOSIS.

Under the title of "KINAZYME" Messrs. G. W. Carnrick and Co., of New York, have introduced a preparation of extract of spleen, enterokinase and other enzymes and harmones of the duodenum, and trypsin and other enzymes of the pancreas.[2] This is conveniently presented in tablet form. It is held that it is of much service in influencing the nutrition of tuberculous patients. Dr. Bayle of Cannes has spoken highly of the use of extract of spleen for consumptive cases. In addition to this, secretin and the pancreatic ferments appear to augment the action of the splenic extract. A study of Dr. Bayle's article in *Revue de Médecine*, June 10, 1911, together with the results of other investigations now available, seem to indicate that this preparation is worthy of extended trial.

COCOA AND CHOCOLATE.

In the treatment of consumptives and other tuberculous patients, considerable difficulty is often experienced in regard to dietetic management, and especially in regard to the provision of acceptable beverages. Milk, the great stand-by, is frequently objected to, and tea and coffee provide but little real assistance, while alcoholic drinks are invariably prejudicial, and in British sanatoria are prohibited. In the preparation of welcome beverages, as permissible sweetmeats and elements in various attractive dishes, the use of cocoa or chocolate is

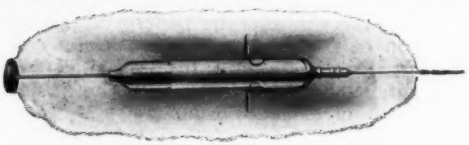
[1] On application being made to Burberrys, 30-33, Haymarket, London, W., an illustrated price-list will be forwarded, giving full particulars of garments suitable for sanatorium life and all kinds of open-air existence.

[2] Messrs. G. W. Carnrick and Co. will supply full particulars regarding "Kinazyme" if application is made to their English representative, Dr. Henry R. Harrower at the British depot, 35, High Street, Hornsey, London, N.

strongly to be advocated. Messrs. J. S. Fry and Sons, of the Cocoa Works, Bristol, supply preparations of cocoa and chocolate which are absolutely reliable.[1] They are well known for their uniform excellence. We may note one or two productions which are specially adapted for tuberculous and tuberculous-disposed patients. One of these is milk chocolate, which combines the qualities of a sweetmeat and a food, and is flavoured with vanilla. A preparation of this kind is very grateful in cases of tuberculosis, especially when the patient has become tired of milk diet. It forms an agreeable variety and is very nourishing. The other preparation which this firm has introduced, and which apparently is very widely appreciated, is malted cocoa. This is an excellent combination of Fry's Pure Cocoa with Allen and Hanburys' Concentrated Extract of Malt. Here the combination of a food such as cocoa with the starch-digesting properties of malt is of much service. In its preparation it is subjected to gentle heat, so as to avoid any injury to the diastase. It is evident that this malted cocoa is specially suited to persons of a weak digestive power, or whose digestion of carbohydrates is impaired, as is often the case in tuberculous subjects. It can be taken at breakfast, luncheon, or supper; and if the preparation were substituted for tea, a great deal of the indigestion so often met with in sanatorium patients might be avoided. The malted cocoa can be made with water, adding cream and sugar to taste, or, if preferred, it may be made with milk, this being the wisest course for the class of case in which we are specially interested.

REQUISITES FOR THE DOCTOR AND THE PATIENT.

The hypodermic method of administering active medicaments offers many advantages. The necessity for the provision of sterile solutions, syringe, and needle, needs no emphasis. Messrs. Allen and Hanburys



A "HYPOSOL" READY FOR USE.

have introduced a contrivance which supplies the whole outfit ready for use without preparation. The "HYPOSOL" unites the functions of an ampoule and a hypodermic syringe.[2] The "Hyposol" (the title of which has been patented and registered) may be described as a thoroughly sterilized, ready-charged, hermetically sealed glass syringe, cheap enough to be discarded after once using; or it can be spoken of as an ampoule, which by the simplest possible adaptation is transformed into an effective syringe, perfectly aseptic and ready for use. It consists, in fact, of a cylindrical glass tube drawn out at either end.

[1] Full particulars regarding Messrs. J. S. Fry and Sons' many excellent preparations of cocoa and chocolate will be sent on application to the Cocoa Works, Bristol.

[2] Full particulars of "Hyposol" outfits and list of "Hyposols" can be obtained from Messrs. Allen and Hanburys, Ltd., 7, Vere Street, Cavendish Square, London, W.

One end is ground to a standard gauge to make a perfect joint with a hypodermic needle, whilst the other end is constructed to admit a piston-rod which will actuate a plunger contained in the barrel. "Hyposols" can be supplied charged with any required solution (up to 2 c.c.) for subcutaneous, intramuscular, or intraspinal injection. A number of vaccines are also available in "Hyposol" form.

Under the title of THE KALOOF COMPRESS a novel appliance has recently been introduced which we think will be of service in private practice as well as in hospitals and sanatoria.[1] The "Kaloof Compress" consists of an asbestos envelope, on one side of which is a loofah pad, and on the other side a covering of non-conductible and impervious material. If the pad be immersed in boiling water, quickly removed, and applied to the skin or wound, it forms an aseptic hot compress, and provides an efficient vaso-dilator and counter-irritant. If immersed in hot carbolic lotion or sprinkled with boracic powder, it becomes a useful antiseptic fomentation. These compresses are now available in various shapes and sizes.

In a previous number of this journal we reviewed Dr. Minchin's book on the use of Allyl Sulphide in the treatment of tuberculosis.[2] Messrs. Allen and Hanburys now supply ALLYL SULPHIDE and SUCCUS ALLIUM SATIVUM in convenient forms for medical administration.[3]

"KASEMOL" is stated to be a reliable non-toxic local analgesic, a "Japanese derivative of menthyl salicylate, in combination with natural oil of camphor, menthol, and distilled aromatics."[4] It is said to be rapidly absorbed, and it certainly affords considerable relief in certain cases of neuritis, myalgia, rheumatism, and the like. It is claimed further that it is of service in chilblains. It is applied to the affected part by means of a small pad of lint, cotton-wool, or camel's-hair brush. We believe it will be helpful in dealing with a number of troublesome and depressing conditions commonly met with during winter months in sanatorium patients.

"SEMPULES" are a new form of suppository for the rectal application of a series of useful medicaments.[5] They are so shaped and formed as to remain in close contact with the affected part, and melt more slowly than the suppositories in common use. We believe "Sempules" will be of service in dealing with conditions met with in not a few tuberculous cases.

EUTHYMOL is a valuable preparation in dealing with a number of minor ailments frequently met with in tuberculous subjects. It is a combination of antiseptics, disinfectants, and deodorants, possessing an agreeable odour, non-poisonous, and having no irritant or staining

[1] The "Kaloof" manufacturers are Messrs. Hudson and Rickett, Ltd., White Hart Lane, Tottenham, London, N., who will send illustrated price list on application.

[2] "Treatment, Prevention, and Cure, of Tuberculosis and Lupus with Allyl Sulphide." By William C. Minchin, M.D. London: Baillière, Tindall and Cox, 8, Henrietta Street, Covent Garden, W.C. 1912.

[3] A list of the preparations available, together with particulars of Dr. Minchin's special inhaler (price 1s. 3d.), can be obtained from Messrs. Allen and Hanburys, Ltd., 37, Lombard Street, London, E.C.

[4] Full particulars regarding "Kasemol" can be obtained from Mr. Edward Cleaver, 13, Clerkenwell Road, London, E.C.

[5] A list of available "Sempules" can be obtained on application to the manufacturers, the British Drug Houses, Ltd., 22-30, Graham Street City Road, London, N.

properties. Messrs. Parke, Davis and Co. supply a series of "Euthymol Preparations" for cosmetic, dental, and general hygienic purposes.[1]

The Bayer Company supply a number of valuable products useful in dealing with many forms of tuberculosis.[2] *Cresotal* and *duotal* are derivatives respectively of creosote and guaiacol; *guycose* is an 8 per cent. solution of calcium guaiacol sulphonate in liquid somatose. *Heroin hydrochloride* is a valuable sedative in a number of irritative conditions of the respiratory system, and often is of great value in alleviating the useless cough of some forms of pulmonary tuberculosis. *Somatose* consists almost entirely of meat albumin in the form of albumose, and contains also the salts of meat which are so necessary in the maintenance of metabolic processes. It can also be obtained as liquid somatose, guycose, iron somatose, irocose, milk somatose, and phosphocose.

"CODEONAL" is a new hypnotic likely to be of service.[3] It is a mixture of 2 parts of diethylbarbiturate of codeine and 15 parts of diethylbarbiturate of soda. It has been found useful in severe cases of tuberculosis of the lungs and larynx.

The "I.K." preparation of Dr. Carl Spengler, referred to in Mr. Fearis' article in this number (p. 19) can be obtained in this country from Messrs. A. and M. Zimmermann.[4]

The tuberculin of Rosenbach is also supplied in this country by Messrs. A. and M. Zimmermann.[5]

"CYSTOPURIN" is another new preparation likely to be useful in certain cases of tuberculosis of the urinary organs and passages. It is a double salt of hexamethylenetetramine and sodium acetate with water of crystallization. It is supplied in convenient tablets by Messrs. A. Wulfing and Co.[6]

Medical practitioners desirous of obtaining reliable summaries of some of the most important of recent articles on new drugs and modern preparations should procure and study the last volume of the valuable Report issued annually by the well-known firm of E. Merck.[7]

[1] Messrs. Parke, Davis and Co., Beale Street, Regent Street, London, W., will supply specimens and particulars on receipt of request from medical practitioners.

[2] Medical practitioners are advised to procure the brochure "Bayer's Pharmaceutical Products," which gives full particulars of the above specialities. A copy will be sent on application to the Bayer Company, Ltd., 19, St. Dunstan's Hill, London, E.C.

[3] "Codeonal" is supplied by Messrs. Knoll and Co., 8, Harp Lane, London, E.C., in glass tubes containing ten tablets each.

[4] For particulars regarding the formation of tenth solutions of "I.K.," as recommended by Dr. Carl Spengler, see "Prescription Formulæ," supplied by Messrs. A. and M. Zimmermann, 3, Lloyd's Avenue, London, E.C.

[5] See "Experiences from the Use of Rosenbach's Tuberculin in Surgical Tuberculosis." By Prof. Dr. F. J. Rosenbach. Copies supplied by Messrs. A. and M Zimmermann, 3, Lloyd's Avenue, London, E.C., the agents in England for the products of Kalle and Co., Biebrich-on-Rhine, Germany.

[6] Particulars and samples may be obtained on application to Messrs. A. Wulfing and Co., 12, Chenies Street, London, W.C.

[7] A copy of the English edition of E. Merck's "Annual Report of Recent Advances in Pharmaceutical Chemistry and Therapeutics," vol. xxv., published by E. Merck, Chemical Works, Darmstadt, 1912, can be obtained from the London office, 16, Jewry Street, E.C.

NOTES.

EDITORIAL.

THE BRITISH JOURNAL OF TUBERCULOSIS with the present number commences its seventh volume. We take this opportunity of expressing alike to contributors and readers our sincere appreciation of their services in making this journal an unqualified success. It is the only British journal devoted solely to the study of tuberculosis in all its forms, and it seeks to represent not unworthily the best work connected with the Anti-Tuberculosis Movement. Since its establishment in 1907 rapid progress has been made in the scientific investigation of tuberculosis, the organization and administration of rational measures for its prevention, and the treatment and amelioration of all classes of patients smitten by the fell disease. We believe this journal has played no insignificant part in directing progress along sound paths. It has throughout insisted on the importance of viewing and dealing with tuberculosis as a great medico-sociological problem, requiring the co-ordination of many forms of national and voluntary effort and enterprise, and the co-operation of all workers for human betterment. It may be well to point out that this journal is an independent organ standing for no particular organization or institution, having no axe of its own to grind, but seeking in every way in its power to assist all good work directed to the extermination of the terrible scourge which ravishes our people. We therefore confidently ask for the continued support of every student of tuberculosis and all engaged in tuberculosis work, so that it may be possible for this journal to extend the scope of its action and become even more fully the representative organ of all the best thought and action in the British Anti-Tuberculosis Movement.

ANTICIPATIONS.

The year 1913 promises to be a momentous period in the history of national and voluntary effort dealing with the tuberculosis problem. In previous issues we have explained in detail the great principles requiring consideration in the formulation of practical measures necessary under a scheme of National Health Insurance. Methods and measures for the scientific and rational administration of so-called "sanatorium benefit" and other forms of assistance and relief are being suggested and initiated in different parts of the country. Some of them are crude, imperfect, irrational, and are bound to result in disappointment and discouragement. Others are ambitious, far-reaching, scientific in aim and design, but will demand much in talents, time, and money. In a period of transition, such as that through which we are passing, it is most desirable that the greatest possible freedom should be allowed for every reasonable form of experiment in the organization and administration of measures specially directed to the relief of tuberculous cases and the assistance of those tuberculously

disposed. It is necessary to assert in no uncertain words that we have much still to ascertain in regard to the pathology of tuberculosis, and, further, that in regard to methods of treatment we have not reached a position when dogmatic assertions can be indulged in with verity or justice. Unless progress is to be barred in certain directions where advance is specially to be desired, great judgment and exceptional circumspection will be necessary in the conduct of all tuberculosis work under the provisions of the National Insurance Act. It is to be hoped that steps will be taken to secure the establishment of a thoroughly representative advisory council of experts to assist in the clinical conduct and scientific research of tuberculosis work under our great national scheme. The staffs of the special London hospitals for consumption and diseases of the chest have approved a number of resolutions which should be of directing value. These are of such importance that we reproduce them here: "(1) That, whatever arrangements be made by the hospitals for consumption and diseases of the chest to enable them to co-operate in dealing with tuberculous cases under the Insurance Act, it is most desirable that for the present such provision as already exists for tuberculous cases of all grades, and of different social groups, be fully maintained. (2) That each special hospital for diseases of the chest should be the central tuberculosis authority in its own area. (3) That all tuberculosis departments or dispensaries in such an area should be co-ordinated with this central authority. (4) That it is desirable that all medical matters relating to the conduct of a tuberculosis dispensary established by a chest hospital should be under the undivided control of the hospital authorities. (5) Each special chest hospital, as a central authority, should be a centre for the training of tuberculosis officers and for post-graduate instruction in tuberculosis. (6) That the formation of a tuberculosis department in connection with each general hospital, with or without an associated dispensary area, is necessary for the adequate practical training of the undergraduate student. (7) That the principle of remuneration for all medical services rendered under the provisions of the Insurance Act in regard to tuberculosis be recognized by the management of each chest hospital. (8) That a standing committee, representative of the medical staffs of the London chest hospitals be constituted to deal with matters of common interest as they arise." The question of medical education in relation to clinical instruction in pulmonary tuberculosis and other forms of tuberculosis presses for immediate consideration. The Royal College of Physicians of London have approved the following resolutions: "(1) That the general hospitals with medical schools be advised each to establish a department for tuberculosis, such department to form part of the general service of the hospital. (2) That the hospitals with medical schools should consider the advisability of applying for provisional "approval" as regards sanatorium benefit. (3) That in localities where it is possible the services of consulting physicians and surgeons should be utilized for consultation in cases of tuberculosis under the Insurance Act." A "watching committee" has also been appointed to consider any future Insurance regulations on the subject of tuberculosis in their relation to medical education. The whole problem bristles with perplexities, but nothing of permanent value is to be gained by a blind devotion to traditional methods of "muddling through" our difficulties.

TUBERCULOSIS AND SCHOOL-CHILDREN.

"Clearly the time is ripe for a thorough inquiry into the relationship of tuberculosis to all phases of school-life." So wrote the editor of this journal in 1908 in his introduction to "Tuberculosis in Infancy and Childhood: its Pathology, Prevention, and Treatment."[1] During the last four years there has been a remarkable awakening to a recognition of the truth and wisdom of this contention. The present position is admirably summarized in Sir George Newman's latest Annual Report just issued, a "blue-book" of the greatest importance.[2] A lengthy section is devoted to "Tuberculosis in School-Children." It is shown that recent events have altered and strengthened the position of education authorities desirous of providing treatment for tuberculous children: (*a*) Notification of all cases of pulmonary tuberculosis, which became compulsory in January, 1912. (*b*) In the Finance Act of 1911 £1,500,000 was set aside for providing or making grants in aid to sanatoria and other institutions in the United Kingdom for the treatment of tuberculosis, or such other diseases as the Local Government Board, with the approval of the Treasury, may appoint. This money will not only be available for sanatoria intended for adults, but also for those intended for children. (*c*) The provision of sanatorium benefit by the National Insurance Act of 1911, though not directly affecting children, will certainly serve to promote the formation of a complete organization for dealing with tuberculosis on a national basis, from which children will undoubtedly benefit. (*d*) The provision of a grant towards the cost of treatment, in institutions, of non insured persons and dependents of insured persons (including children) suffering from tuberculosis. A part of this sum may be available for the treatment of children. (*e*) Lastly, there is the provision of the Board of Education grant in aid of medical treatment and work ancillary thereto. Under the Board's regulations a portion of this grant is allocated to the treatment (in a broad sense) of tuberculous children attending day or residential schools. It is interesting to note that the Board consider that a school clinic and a tuberculosis dispensary may, if necessary, be housed in the same building, provided—(*a*) That the rooms used by tuberculous patients, adults or children, are separate and distinct from the rooms used by school-children attending the clinic for complaints other than tuberculosis, separate entrances and waiting-rooms being arranged; (*b*) that all reasonable precautions are taken in regard to the infection of premises, etc.; and (*c*) that appropriate arrangements are made for correlating the work of the school medical officer with the work of the tuberculosis officer in the area. Sir George Newman's summary so well indicates the lines along which future advance must be made that we quote it here: "The main points for the consideration of education authorities in regard to tuberculosis appear to be—(1) Improved arrangements for securing the detection and diagnosis of the disease among children, possibly in association with the tuberculosis dispensary when such exists; (2) the provision of additional accommodation for residential

[1] "Tuberculosis in Infancy and Childhood: Its Pathology, Prevention, and Treatment." By Various Writers. Edited by T. N. Kelynack, M.D. London: Baillière, Tindall and Cox, 8, Henrietta Street, Covent Garden. 1908. Price 12s. 6d. net.

[2] "Annual Report for 1911 of the Chief Medical Officer of the Board of Education." London: Wyman and Sons, Ltd., Fetter Lane, E.C. 1912. Price 1s. 5d.

treatment, particularly of 'surgical' cases; (3) an extension of open-air teaching by means of open-air schools, playground classes, etc., and, if possible, by the establishment of 'night-camps'; (4) the need for systematic and prolonged after-care and following up. The importance of attacking the disease in childhood cannot be too often repeated, and the fact that the infection, at least in pulmonary cases, is frequently slight in degree, and that spontaneous recovery often occurs, does not mean that effective treatment is not required."

All interested in the care of tuberculous and tuberculously disposed children should study Professor Nietner's splendid lecture on "The Modern Combat against Tuberculosis amongst Children."[1]

RECORDS OF PROGRESS.

The rate of progress in regard to matters relating to tuberculosis is being quickened. There is a noticeable "speeding-up" in all forms of activity. Recent events have done much to inform the ignorant and arouse the apathetic to the urgent need for action. We have repeatedly referred to the desirability of establishing a Central Tuberculosis Bureau which should be available for reference by all workers engaged in any form of tuberculosis work. Such a centre has now become a pressing necessity.

There can be no doubt but that under the provisions of the National Insurance Act there will be a rapid multiplication of sanatoria and other institutions for the treatment of all sorts and conditions of tuberculous cases. It is to be hoped that plans for the establishment of such places will be carefully considered and subjected to expert opinion before extensive and expensive schemes are entered upon. The experience gained in the planning, construction, organization, and administration of already existing sanatoria must not be allowed to go for nothing.

Dr. B. H. Vos, the medical superintendent of the "Volkssanatorium voor Borstlijders te Hellendoorn," has kindly sent us a photograph of the new pavilion which has been erected in connection with the sanatorium of which he is in charge. The pavilion accommodates from fifty-six to sixty-four patients. The original sanatorium provided fifty-four beds; now 156 patients can be cared for.

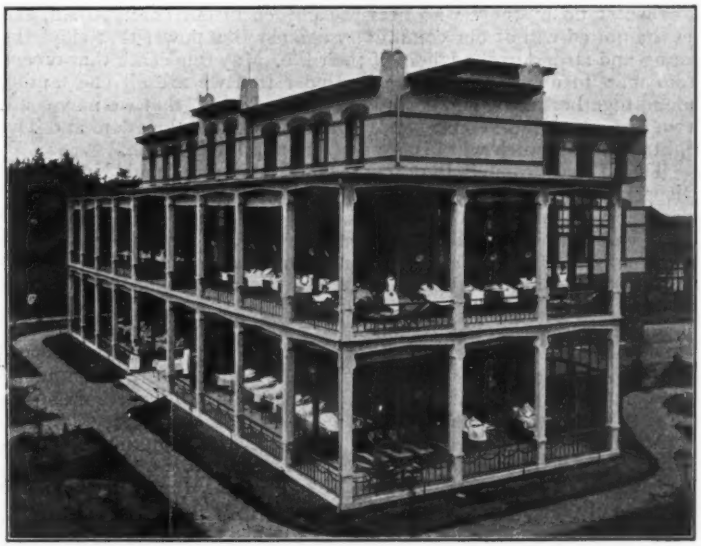
In the combat with Consumption, Science and Art and all Powers making for Hygienic Righteousness may well combine. We have recently been privileged to witness a performance of the new tuberculosis play, "The Triumph." This remarkable work has been written by Florence Eaton and William Crossing, founded on the former's book, "The White Demon." Its production under the auspices of the Women's Imperial Health Association and the Women's National Health Association of Ireland has clearly demonstrated the effective aid which dramatic art may render as an educational agent in the formation of a sound public opinion in regard to tuberculosis. The play shows how the White Demon of Consumption and his death-dealing satellites may be overcome by the ministering fairies of modern hygiene. The bad fairies, Ignorance, Worry, Lazy-Bones, Potheen, Squalor, Cross-Patch, Whining, and the army of Microbes, are all finally defeated by the good fairies, Sunshine, Knowledge, Love,

[1] This lecture is reported fully in the *Lancet*, November 16, 1912.

Joy, Commonsense, Purity, etc., and the many Sunbeams and other auxiliary forces of Conquering Goodness. The play teaches great lessons, and we trust means will be found for its presentation to many audiences.[1]

The Cinematograph is another instrument which is rendering valuable aid in the enlightenment of the people as to ways and means whereby they may protect themselves from the Great White Plague. Dr. Philip P. Jacobs has written a striking article on "Tuberculosis in Motion Pictures," which we commend to the notice of our readers.[2]

Dr. Jacobs has also provided a splendid article, admirably illustrated, on "The Christmas Seals," in which he shows[3] that "Nearly $1,000,000 has been realized since 1908, when the American Red Cross



THE NEW PAVILION OF THE DUTCH PEOPLE'S SANATORIUM, HELLENDOORN, HOLLAND.

issued, at Miss Bissell's persuasion, the first seal for the benefit of the national Anti-Tuberculosis Movement."

[1] Full particulars regarding "The Triumph" and details as to facilities for its performance in part or in whole may be obtained on application to Miss E. M. James, B.A., The Women's Imperial Health Association, 7, Hanover Square, London, W.

[2] "Tuberculosis in Motion Pictures," by Philip P. Jacobs, Ph.D., appears in the *Journal of the Outdoor Life*, December, 1912. Published monthly in the interests of the Anti-Tuberculosis Campaign, 289, Fourth Avenue, New York. Price 10 cents a copy; annual subscription, 1 dollar.

[3] See "The Christmas Seals," by Philip P. Jacobs, *The Survey*, December 7, 1912. Published by Survey Associates, Inc., 105, East Twenty-second Street, New York, U.S.A. Particulars of the "Red Cross Seals" may be obtained from the headquarters of the National Red Cross Seal, 715, Union Trust Building, Washington, D.C.

"Tuberculosis Day" is becoming a well-recognized institution in America. President Taft recently wrote: "I hope and believe that a 'Tuberculosis Day' in the churches will be productive of great good." The following "Tuberculosis Day Prayer" has been composed by Dr. Walter Rauschenbusch.[1] We believe there are many in this country who will be glad to have a copy of this very beautiful prayer:

"O God, we pray Thee for all whose vigour is being drained by slow and wasting illness. Strengthen their powers as they battle for their life, and, if it be possible, we beseech Thee to restore them and grant them the fulness of their years. If their strength is failing, give them courage still to labour cheerfully, and to leave to those who love them dear memories of faith and patience for the distant days. Since we are all jointly guilty of the conditions which have bred their disease, may we stand by those who bear the burden of our common sin, and set the united will of our community against this power that slays the young and strong in the bloom of their life. May this death that creeps from man to man be a solemn reminder that we are all one family, bound together in joy and sorrow, in life and death, that we may cease from our selfish indifference, and together seek Thy kingdom and Thy righteousness, which will bring us health and life. Amen."

The Third Annual Report of the Paddington and Kensington Dispensary for the Prevention of Consumption contains a lengthy record by the medical officer in charge, Dr. David J. Williamson, of much valuable work undertaken for many of the consumptives of the Metropolis.[2] There is a particularly attractive, suggestive, and well-illustrated section on the work of the open-air school at Kensal House.

The Twelfth Annual Report of the Canadian Association for the Prevention of Tuberculosis is a portly volume containing a fine record of work carried on with conspicuous success throughout the Dominion.[3] The volume contains addresses and papers dealing with various aspects of the tuberculosis problem.

All interested in the treatment of tuberculous and tuberculously-disposed children should read the important address delivered by Professor Nietner at the Medical School of the Royal Hospital for Diseases of the Chest, City Road, London.[4]

Messrs. Mayer and Meltzer have just issued an excellent illustrated "Catalogue of Instruments used in the Practice of Laryngology, Rhinology, and Otology."[5]

New regulations just issued by the Local Government Board state that non-pulmonary tuberculosis will be included in the list of compulsory notifiable diseases from Febuary 1, 1913.

[1] The above "Tuberculosis Day Prayer," by Dr. Walter Rauschenbusch, appeared in *The Survey* for October 26, 1912.

[2] Third Annual Report of the Paddington and Kensington Dispensary for the Prevention of Consumption, 20, Talbot Road, London, W. (Telephone: 280, Western). London: Morton and Burt, Ltd., Paddington and Willesden.

[3] Twelfth Annual Report of the Canadian Association for the Prevention of Tuberculosis, with Transactions of the Annual Meeting held in Toronto, Ontario, May 20 and 21, 1912. Pp. 316. Toronto: William Briggs. 1912.

[4] Nietner: "The Modern Combat against Tuberculosis amongst Children," *Lancet*, November 16, 1912.

[5] We understand a copy of this Catalogue will be sent to any medical practitioner applying to Messrs. Mayer and Meltzer, 71, Great Portland Street, London, W.